USDA Farm Service Agency
U.S. DEPARTMENT OF AGRICULTURE

DRAFT

Programmatic Environmental Assessment Harney Valley Groundwater

Conservation Reserve Enhancement Program
Harney County, Oregon

Prepared for:
State of Oregon
Oregon Water Resources Department
725 Summer Street NE, Suite A Salem, OR 97301

February 2023

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Cover Sheet

Proposed Action: The United States Department of Agriculture (USDA), Commodity Credit Corporation and the State of Oregon have proposed to implement the Harney Valley Groundwater Conservation Reserve Enhancement Program (CREP), a component of the Conservation Reserve Program. USDA is provided the statutory authority by the provisions of the Food Security Act of 1985, as amended (16 United States Code 3830 et seq.). The Conservation Reserve Enhancement Program is defined in the Agricultural Improvement Act of 2018. USDA also has authority under the Regulations at 7 Code of Federal Regulations (CFR) Part 1410. In accordance with the amended 1985 Act, USDA/CCC is authorized to enroll lands. The Farm Service Agency (FSA) administers the Harney Valley Groundwater CREP on behalf of the CCC. FSA proposes to implement the CREP Agreement with the State of Oregon. CREP is a voluntary land conservation program for agricultural landowners.

Type of Document: Programmatic Environmental Assessment

Lead Agency: USDA, Farm Services Agency (FSA)

Sponsoring Agency: Oregon Water Resources Department

Cooperating Agency: Oregon Watershed Enhancement Board

Further Information: State of Oregon
Attn: Doug Woodcock, Acting Director Oregon Water Resources Department 725 Summer Street NE, Suite A
Salem, OR 97301

Comments: This DRAFT Programmatic Environmental Assessment (PEA) was prepared in accordance with USDA FSA National Environmental Policy Act (NEPA) implementation procedures found in 7 CFR Part 799, as well as the NEPA of 1969, Public Law 91-190, 42 United States Code 4321-4347, 1 January 1970, as amended.

A copy of the Draft PEA can be found at https://www.fsa.usda.gov/state-offices/Oregon/resources/index.

Written comments regarding this PEA can be submitted to the address below until May 26, 2023:
Harney Valley Groundwater CREP PEA Comments
Washington FSA State Office
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ACRONYMS AND ABBREVIATIONS

AWG Agricultural Work Group
BLM Bureau of Land Management
CBWP Community-Based Water Planning Program
CCAA Candidate Conservation Agreement with Assurances
CEQ Council on Environmental Quality
CFR Code of Federal Regulations
CO2 Carbon Dioxide
CP Conservation Practice
CREP Conservation Reserve Enhancement Program
CRP Conservation Reserve Program
DOI Department of the Interior
EIS Environmental Impact Statement
EO Executive Order
EOARC Eastern Oregon Agricultural Research Station
EQIP Environmental Quality Incentive Program
ESA Endangered Species Act
FSA Farm Service Agency
GDE Groundwater Dependent Ecosystem
GHVGAC Greater Harney Valley Groundwater Area of Concern
GHG Greenhouse Gas
MNWR Malheur National Wildlife Refuge
NAAQS National Ambient Air Quality Standards
NASS National Agricultural Statistical Service
NAWQA National Water Quality Assessment
NDIS Natural Diversity Information Source
NEPA National Environmental Policy Act
NPS National Park Service
NRCS Natural Resources Conservation Service
ODA Oregon Department of Agriculture
ODFW Oregon Department of Fish and Wildlife
OSU Oregon State University
OWEB Oregon Watershed Enhancement Board
OWRD Oregon Water Resources Department
PEA Programmatic Environmental Assessment
PIP Practice Incentive Payment
ROI Region of Influence
SHPO State Historic Preservation Office
TNC The Nature Conservancy
U.S. United States
USACE U.S. Army Corps of Engineers
USCB U.S. Census Bureau
USDA U.S. Department of Agriculture
USEPA U.S. Environmental Protection Agency
USFS U.S. Forest Service
USFWS U.S. Fish and Wildlife Service
USGS U.S. Geologic Survey
VOC Volatile Organic Compound

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Executive Summary

Introduction

This Programmatic Environmental Assessment (PEA) describes the potential environmental consequences resulting from the implementation of the proposed Harney Valley Groundwater (HVG) Conservation Reserve Enhancement Program (CREP) Agreement. The environmental analysis process is designed to ensure the public is involved in the process and informed about the potential environmental effects of a federal action and to help decision makers take environmental factors into consideration when making decisions related to the proposed action. This analysis is programmatic in nature and does not address individual site-specific impacts, which would be evaluated for individual CREP contracts prior to approval.

The United States Department of Agriculture (USDA) Commodity Credit Corporation (CCC) in cooperation with the State of Oregon through the Oregon Department of Water Resources (OWRD) proposes to implement a CREP Agreement within the Harney Basin in the State of Oregon. The USDA Farm Service Agency (FSA) administers the CREP on behalf of the CCC. This PEA has been prepared to analyze the potential environmental consequences associated with implementation of the Proposed Action, An Alternative Action, or No Action Alternative.

The Harney Basin is located in the southeast portion of Oregon and drains approximately 5,000 square miles. The basin has internal drainage to Malheur and Harney Lakes and is the northernmost extension of the Great Basin. The Harney Basin is an important cattle producing region of Oregon and is also important for the production of alfalfa and grass hay.

Due to the limited amount of precipitation, agriculture in this area is heavily dependent on center pivot sprinkler systems to irrigate cropland. The aquifer system is largely composed of alluvium and volcanic tuffaceous deposits overlying and embedded with basalt or other volcanic deposits. Areas of the Harney Valley have documented groundwater level declines. The Oregon Water Resources Department (OWRD) established the Greater Harney Valley Groundwater Area of Concern (GHVGAC) in 2016 and stopped accepting additional groundwater permit applications for the designated area. In addition, the OWRD placed requirements on the permits that were issued but not developed. Irrigated agriculture is the largest water use in the Harney Basin, consuming over 95 percent of all water used. The proposed CREP would occur within the GHVGAC entirely within Harney County, Oregon.

Project Purpose and Need

Under Oregon law, all water within the state belongs to the public. The Oregon Water Resources Department has the responsibility for determining the amount of water available and allocating the available surface and groundwater to in-stream and out of stream uses. The health and future of Oregon's groundwater resources is a priority in Oregon's 2017 Integrated Water Resources Strategy (Mucken and Bateman, 2017). Upon the determination that the groundwater conditions in the Harney basin are significantly out of balance with groundwater pumping by more than 110,000 acre-feet than is recharged annually, the potential of using the CREP program to reduce the use of groundwater was explored.

After significant community discussion, a proposal was developed to reduce groundwater use for irrigation by offering CRP payments for enrolling groundwater irrigated agricultural lands requiring the associated water rights to be voluntarily cancelled permanently in a partnership with the Oregon Water Resources Department. A primary purpose of the Proposed Action is to implement the proposed Harney Valley Groundwater (HVG) CREP Agreement for the State of

Oregon. The HVG CREP Proposal is needed to reduce groundwater demands and help restore long-term sustainability of groundwater resources in the Harney Basin. The HVG CREP Proposal would also enhance groundwater dependent ecosystems and reduce depletion of the shallow and deep aquifers within the Harney Basin. The proposed CREP area is entirely within Harney County, Oregon and is limited to the area of the Greater Harney Valley Groundwater Area of Concern as identified in Attachment A.

There are approximately 95,000 acres of groundwater irrigated land within the total CREP Area. While there is general decline in the level of the aquifer, there are four areas in the GHVGAC where acute groundwater level declines have been documented. Reducing groundwater irrigation and maintaining the potential for dryland agricultural production throughout the GHVGAC area would allow a transition in agricultural use of the land and reduce the dependence upon irrigated production.

Proposed Action and Alternatives Considered

20,000 Acre Proposed Action

Under the proposed action, FSA, on behalf of the CCC, proposes to implement a CREP Agreement (Agreement) in the Harney Basin in the State of Oregon. The Agreement would allow enrollment of up to 20,000 acres of groundwater irrigated cropland within Harney County CREP area (Figure ES-1). The Proposed Action would include establishing CRP contracts with producers of eligible lands in order to implement approved Conservation Practices (CPs). The CPs would include: CP1, Introduced Grasses and Legumes; CP2, Native Grasses and Legumes; CP4D, Permanent Wildlife Habitat – Noneasement; and CP23 & 23A, Wetland Restoration & Wetland Restoration Non-floodplain.

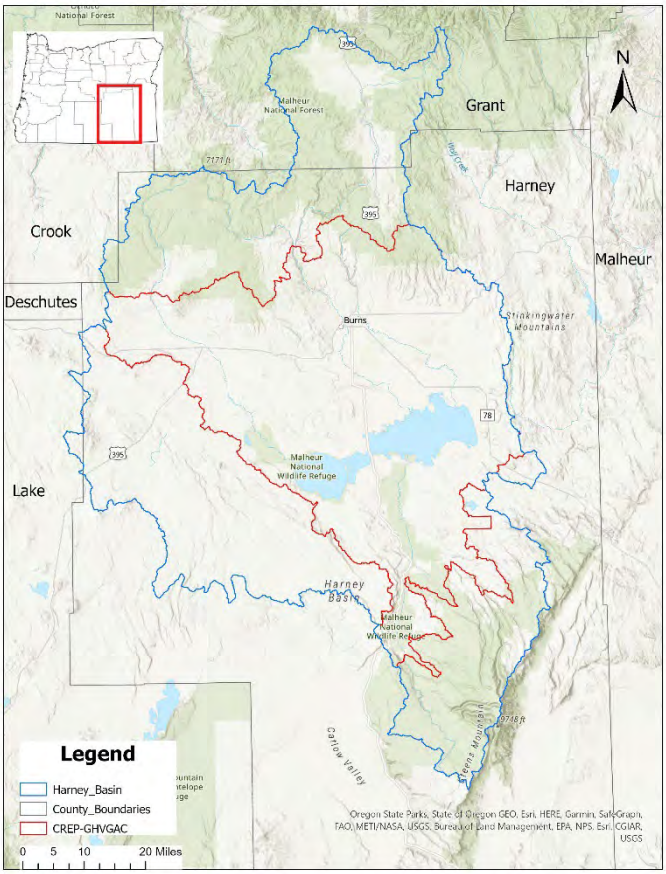


Figure ES-1: Proposed Harney Valley Groundwater CREP Area

Producers would receive technical and financial assistance for installing and maintaining the practices as well as annual rental payments for lands enrolled in the program and other incentives where applicable. The primary objectives of the Harney Basin CREP are to conserve groundwater, reduce soil erosion, improve water quality, and enhance groundwater dependent ecosystems. Additional energy conservation benefits are also expected.

State provided financial incentives are proposed for permanent voluntary cancellation of water rights, cost share for well abandonment or conversion to livestock well, and conservation benefits to groundwater dependent ecosystems.

15,000 Acre Alternative

The community discussed an alternative that included having a goal of 15,000 acres for enrollment with an option to voluntarily cancel the associated water right(s). It was understood that few producers would voluntarily cancel their water rights. Under this alternative,

groundwater reductions would typically be only for the duration of the CREP contract. For groundwater use reduction over more than 15 years, contract reenrollment would be necessary. Since groundwater use is as much as 110,000 acre-feet above recharge on an annual basin, 15-year contracts would only delay the eventual depletion of the aquifer. The 15,000-acre proposal does not provide a solution to the significant over allocation of groundwater in the Harney Valley.

This alternative would also likely result in OWRD designating "Critical Groundwater Management Area(s)" and curtailing junior water rights, leaving irrigators with limited options and no economic compensation for changed use of the land.

No Action Alternative

Under the No Action Alternative, the Agreement would not be implemented. The Conservation Reserve Program (CRP) and other conservation programs would continue to be available to producers; however, the additional benefits of the proposed Agreement would not be realized. Conditions of the aquifer would continue to decline ultimately hindering long-term sustainability of the groundwater supply in this area and potentially the long-term agricultural viability affecting the regional economy. Additionally, the State of Oregon will likely designate specific areas of groundwater decline as "Critical Groundwater Management Area(s)." where severe declines in groundwater levels are occurring. With no action to voluntarily reduce groundwater withdrawals, the designation will result in increased regulation of groundwater by curtailing water use by junior water right holders creating an immediate and unpredictable impact to the agriculture economy. The Oregon Water Resources Department could also designate the area as a "Serious Water Management Problem Area" and require monitoring devices on all wells.

ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

The PEA addresses the following resource areas: biological resources (wildlife, vegetation, and special status species); water resources (ground water, surface water, water quality, and wetlands); earth resources (geology, topography, and soils); cultural resources; recreation; socioeconomics; and environmental justice. A summary of the potential environmental consequences to each of these resources is provided below.

Biological Resources

Overall, implementation of the Proposed Action would have beneficial impacts to biological resources. Restoring agricultural lands to more natural states under the four approved CPs would increase native vegetation, restore and enhance sagebrush and grassland habitats important to sage grouse, a candidate species. Improving these habitats would increase wildlife diversity, especially game species. The proposal includes incentive payments for projects that would protect groundwater dependent ecosystems.

Site-specific evaluation and the required conservation planning process prior to enrolling land in CREP would identify special status species or critical habitat. Consultation with U.S. Fish and Wildlife Service or the Harney County Soil and Water Conservation District could help to implement the Harney County Candidate Conservation Agreement with Assurances (CCAA) for Greater Sage-Grouse. The basin also is the site of the Malheur National Wildlife Refuge a critical area for migratory and resident waterbirds in the Pacific flyway. While only a small area of the groundwater area is suitable for wetland restoration, there may be opportunities for CP23/23A that would add to the waterbird habitat of the valley.

Water Resources

The Agreement would have long term beneficial impacts to groundwater resources within the Harney Basin. Enrolling land in CREP and installing approved CPs (vegetation planting, native grasses and shrubs) would decrease groundwater withdrawal, reduce the application of agricultural chemicals (pesticides and fertilizers) in the Harney Valley CREP Area, and reduce erosion and sedimentation, ultimately increasing groundwater storage. For enrollment in the Harney Valley Groundwater CREP, a water right holder volunteers to cancel their water right permanently in exchange for additional compensation by the State of Oregon of $825/acre. Retirement of irrigated lands under CREP would reduce the over allocation of groundwater and move towards addressing the discharge imbalance in the basin.

Soil Resources

Long-term positive impacts to soil resources are expected to occur with the implementation of the four proposed CPs outlined in the proposed Agreement. Removing groundwater irrigated agricultural lands from production would also benefit water quality by reducing soil erosion and sedimentation caused by typical agricultural practices. During implementation of any of the CPs, there would be potential for temporary minor, increases in erosion from any tillage, planting, or earthmoving activities required to establish the practices. However, once the CPs are established, long-term beneficial impacts to soil resources would occur from the established permanent cover (over the course of the 15-year contract) and removing the need to work the soil for agricultural purposes. Permanent covers would largely entail planting of native arid and semi-arid grasses, legumes, shrubs and pollinator species. Decreases in wind erosion are also expected and would provide related air quality benefits. Conservation Plans for the conversion of groundwater irrigated cropland to one of the CPs would need to address the potential for noxious weed infestations. The conversion of cropland to native or adapted species cover has the risk of weedy species invasion.

Cultural Resources

The Proposed Action would occur on previously tilled cropland. While the entire area is within the area of the Malheur Indian Reservation (established in 1872 and eliminated in 1879), it is unlikely that unknown cultural resources would be impacted under the Proposed Action because all areas eligible to be enrolled in the CREP have been under cultivation. As part of the CREP enrollment process, a site- specific evaluation would be done to determine land eligibility and the presence or potential for encountering a cultural resource. Consultation with the State Historic Preservation Officer and the cultural resources office of the Burns Paiute Tribe would occur as necessary during the site-specific evaluation. In accordance with FSA policy, enrollment into CREP would be denied if a cultural resource impact was expected.

Recreation

During establishment of the CPs, there would be short-term negative impacts to local game species due to construction activity. However, once the CPs are established, there would be some marginal hunting, and wildlife viewing opportunities in the Harney Basin over the long-term because of the potential 20,000 acres of improved wildlife habitat.

Socioeconomics

The Proposed Action could remove 20,000 acres of agricultural land from production within the CREP Area. This would represent approximately 16 percent of the groundwater irrigated farmland within the CREP Area and 1 percent of the total farmland in the Basin. While this

represents a small percentage of the total agricultural land, removing it from agricultural production would also remove all cost inputs to that land, such as labor, agricultural chemicals, seed, and energy. Removing the land would have a negative effect on the producers of those inputs. Given the rather small percentage of agricultural land targeted, these negative impacts would likely be minor in nature. Over the life of the proposed Agreement, up to approximately $60 million of Federal and state funds would be paid to producers that enrolled their lands. Annual rental payments and applicable incentive funds would help to offset negative impacts from loss of farm income. Additionally, removal of land from production may raise commodity prices due to reduced supply, thereby allowing local producers to collect more revenue per acre from the crops they continue to grow. There is also the potential to increase recreational uses of enrolled lands for wildlife dependent recreation, such as hunting and wildlife viewing. Improvement of wildlife habitat may lead to expenditures in recreation related goods, hunting supplies, as well as gas and lodging expenditures. Decreases in hay production may result in increases in hay shipments for livestock needs from outlying areas.

Environmental Justice

The Burns Paiute tribal lands and allotments constitute environmental justice population areas in the Region of Influence (ROI). Groundwater irrigation is not used on the allotments and the Burns Paiute Reservation has adequate surface and groundwater supplies. Reducing the decline in groundwater levels could help with the sustainability of the groundwater supplies for these populations. Most of the proposed CREP Area in Harney County is considered a low-income population. The potential for minor positive and negative disproportionate impacts on low-income populations exists, but would depend on where producers are located in relation to these populations.

15,000 ACRE ALTERNATIVE

The alternative for temporary reduction in groundwater use through 15-year contracts would have short term effects similar to the proposed action over the life of the contract. The greatest concern is the failure to address the chronic overuse of groundwater. The most recent groundwater study has identified a significant imbalance between recharge and discharge with groundwater irrigation being the predominant source of discharge. While this alternative would have less impact to property values, it would not accomplish the primary goal of reducing the overallocation of groundwater.

NO ACTION ALTERNATIVE

Under the No Action Alternative, the proposed Agreement would not be implemented. Agricultural production would continue within Harney County. Groundwater declines would continue with adverse effects on domestic well owners, stock water well owners, and other exempt uses, increase pumping costs reducing the cost effectiveness of irrigation agriculture, deepening wells, and lead to losses of agricultural production in the long run. Based on the recent information on the imbalance of discharge and recharge, The Oregon Water Resources Department will reopen the basin rules for the Malheur Lakes Basin (OAR 690 Division 512). The reopening of the basin rules could be accompanied by additional restrictions and/or reductions on groundwater use and the likely designation of “Critical Groundwater Management Area(s).” Such designations will result in the development of management measures which would involve curtailing junior water users and other measures to halt groundwater declines.

CUMULATIVE IMPACTS

This action, in conjunction with reasonably foreseeable activities, can have a measurable impact on the rate of groundwater decline and reduce the demand for agricultural irrigation from groundwater. Implementation of the program is expected to add positively to the long-term cumulative impacts to biological, water, earth, and other protected resources in the proposed CREP area. Cumulative impacts from implementation of the Proposed Action would generally be positive, over the life of the CREP contract (15 years) and beyond with the permanent voluntary cancellation of water rights. Biological resources, water, soil, and recreation would all experience beneficial impacts from implementing the Agreement. There may be slight negative regional socioeconomic impacts from removing agricultural lands from active production to enroll those lands in a conservation program. While the producer enrolling the land may benefit financially, land enrolled in conservation programs would not have the same positive economic impact to the local community since the indirect expenditures from the sale of goods and services to support agricultural production (seed, chemical input, equipment, electricity, etc.) would not occur. On the other hand, the reduction in the imbalance of groundwater would have a beneficial effect on the long-term continuation of agricultural production by extending the life of the aquifer.

MITIGATION MEASURES

There are no expected long-term significant negative impacts associated with implementation of the proposed Agreement. Prior to installation of CPs, producers must complete site-specific environmental evaluations which would reveal any protected resources on the property. In those site-specific instances where a wetland, or a cultural resource may be present, consultation with the appropriate lead agency would identify specific mitigation measures required to eliminate or reduce the negative impacts to an acceptable level. The USDA approved conservation plan will guide actions necessary to accomplish the conservation outcomes anticipated. The greatest concern is the spread and establishment of invasive weed species. The conservation plan will need to specifically address measures to control invasive weeds to the extent practicable.

CHAPTER 1 PURPOSE AND NEED FOR THE PROPOSED ACTION

The United States Department of Agriculture (USDA) Farm Service Agency (FSA) proposes to implement a Conservation Reserve Enhancement Program (CREP) Agreement within the Harney Basin in the State of Oregon (Appendix B). This Programmatic Environmental Assessment (PEA) has been prepared to analyze the potential environmental consequences associated with implementation of the Proposed Action, an Alternative Action, and a No Action Alternative. USDA Farm Service Agency (FSA) and the Oregon Water Resources Department administer the Harney Valley Groundwater (HVG) CREP. This analysis is programmatic in nature and does not address individual site-specific impacts, which would be evaluated for individual CREP contracts prior to approval.

1.1 BACKGROUND

1.1.1 Conservation Reserve Program

On behalf of the CCC, the FSA administers the Conservation Reserve Program (CRP), the federal government's largest private land environmental improvement program. CRP was established under Title XII of the Food Security Act of 1985 (16 USC 58 Part 3831, 1996). CRP is a voluntary program that supports the implementation of long-term conservation measures designed to improve the quality of ground and surface waters, control soil erosion, and enhance wildlife habitat on environmentally sensitive agricultural land. CRP participants enter into contracts for periods of 10 to 15 years in exchange for annual rental payments and cost-share assistance for installing certain conservation practices (CPs). The environmental impacts of CRP was originally studied in the 2003 Programmatic Environmental Impact Statement (EIS) (USDA 2003). Changes to CRP, as set forth by the Farm Security and Rural Investment Act of 2008 (Farm Bill), were addressed in the 2010 and 2014 Supplemental EIS (USDA 2010). Following the adoption of the Agricultural Improvement Act of 2018, a 2019 draft PEA of the Conservation Reserve Program was announced for public review. The Final Supplemental PEA was published in November 2019 and provides FSA decision makers with programmatic level analyses that provide a context for the state specific PEAs.

1.1.2 Conservation Reserve Enhancement Program

CREP was established in 1997 under the authority of CRP to address agriculture related environmental issues by establishing conservation practices (CPs) on agricultural lands using funding from State, Tribal, and Federal governments as well as non-government sources. CREP varies from traditional CRP in four important ways:

- CREP is targeted to specific geographic areas and is designed to focus CPs on addressing specific environmental concerns.
- CREP is a partnership between USDA and a state, political subdivision, agency, or non-government source.
- CREP is results-oriented and requires the CREP partner to establish measurable objectives and conduct annual monitoring to measure progress toward achievement of those objectives.
- CREP is flexible, within existing legal constraints, and may be adapted to meet local conditions on the ground.

CREP addresses locally identified (state, Tribal, etc.) high priority conservation issues in defined geographic areas. Producers who enroll their eligible lands in CREP receive financial and technical assistance for establishing CPs on their land as well as annual rental payments through a 10-to-15-year contract. Once eligible lands are identified, site specific environmental reviews

and consultation with, and permitting from, other Federal agencies are completed as appropriate. Eligible land criteria was set forth in the Farm Bill of 2018 and detailed in the FSA Handbook: *Agricultural Resource Conservation Program for State and County Offices* (2-CRP, Revision 6).

Participants are required to prepare a conservation plan that details the establishment and maintenance of CPs to ensure the goals of CREP are met throughout the life of the contract. For some CPs, a wildlife conservation plan must also be developed to ensure the practices meet their intended goals.

1.1.3 Previous Oregon CREP

In 1997 Oregon proposed a statewide CREP to address riparian conditions to protect and restore salmon and steelhead habitats. The Oregon CREP was based on an economic analysis that provided guidance for a cumulative effects payment and also provided an incentive for conserving stream flow through time-limited water leases. The program was modified in 2004 to address water quality, primarily temperature, in agricultural streams throughout Oregon. The program has provided conservation benefits to some 1,500 miles of streambank throughout Oregon.

1.1.4 The Harney Basin

The Harney Basin is entirely within the State of Oregon (Figure 1-1). The proposed CREP area is the entire Greater Harney Valley Groundwater Area of Concern (GHVGAC) which is composed of portions of four 8-digit Hydrologic Units; 17120001, Harney/Malheur Lakes, 17120002, Silvies, 17120003, Donner und Blitzen, and 17120004 Silver. The Harney basin is a 5,245 square mile northern extension of the Great Basin composed of four subbasins (Table 1.1.-1). The CREP area is the GHVGAC (Appendix A), a 2,386 square mile portion of the Harney Valley that encompasses nearly all groundwater irrigated lands (Table 1.1.-2). This area includes some 95,683 acres that are permitted for groundwater irrigation.

Figure 1-1: Harney Basin in Oregon

Table 1.1-1: Harney Valley Subbasins (data from NRCS, 2006)

Watershed	Area (acres)	Area (square miles)
Silver Creek	1,086,400	1,697.5
Silvies River	814,900	1,273.3
Donner und Blitzen	506,300	791.1
Harney Malheur Lakes	949,700	1,483.9
Harney Basin	**3,375,300**	**5,245.8**

Table 1.1-2: Greater Harney Valley Groundwater Area of Concern (data from OWRD, 2015)

CREP Area	Area (acres)	Area (square miles)
"Greater Harney Valley Area" Harney Valley and adjoining Valleys and Bounding Uplands	1,526,830	2,385.7

1.2 THE PROPOSED ACTION

The Proposed Action is to implement a CREP Agreement for the GHVGAC. Specifically, the HVG CREP proposes to enroll up to 20,000 acres of land actively irrigated with groundwater to reduce the overallocation of groundwater, reduce annual groundwater use, reduce inputs affecting groundwater quality, reduce soil erosion, and conserve groundwater dependent ecosystems. Eligible producers would receive financial and technical assistance in exchange for removing cropland from active agricultural irrigation under a long-term contract of 14 to 15 years. Producers that enroll land would be required to voluntarily cancel their water rights to that land permanently. The Commodity Credit Corporation would offer NASS approved soil rental rates for the CRP contracts established under this project. The state of Oregon would pay for the voluntary cancellation of the associated water rights and provide incentives for well capping/closure and for conservation of groundwater dependent ecosystems.

1.3 PURPOSE AND NEED

The purpose of the Proposed Action is to implement the proposed Agreement with the State of Oregon. The proposed Agreement is needed to reduce the groundwater demands and help restore long-term sustainability of groundwater resources in the Harney Basin. The proposed Agreement would facilitate the transition of agricultural land management from groundwater irrigation to dryland management, contribute to the improvement of the Harney Basin aquifers, and provide incentives for conservation of groundwater dependent ecosystems.

1.4 OREGON HARNEY VALLEY GROUNDWATER CREP OBJECTIVES

The critical State Objective for the HVG CREP is to reduce the use of groundwater in the Harney Valley. The basin is overallocated and recent analysis estimates annual groundwater use beyond recharge is some 110,000 acre-feet. The CREP program gives landowners a choice that provides compensatory income over a 15-year time frame and payment from the State for voluntary cancellation of their water right(s). Target goals of the program is to enroll up to 20,000 acres of groundwater irrigated agricultural lands within the GHVGAC. The program is designed to meet specific conservation goals and objectives related to agriculture:

- Reduce groundwater extraction by up to 50,000 acre-feet/year.
- Establish 20,000 acres of permanent upland vegetation to serve as native cover for wildlife.
- Reduce sulfur, phosphorus and nitrogen inputs to the basin by respectively 1,000, 780, and 165 tons/year.
- Protect groundwater dependent ecosystems by providing an incentive payment for nearby wells potentially affecting their function or future function.
- Provide the opportunity to convert irrigation wells to stockwater wells for long-term grazing use of the land.
- Provide an incentive payment for the abandonment of an enrolled well.

1.5 REGULATORY COMPLIANCE

This PEA has been prepared to satisfy the requirements of the National Environmental Policy Act (NEPA) (Public Law 91-190, 42 U.S. Code 4321 et seq.); implementing regulations adopted by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations [CFR] Parts 1500-1508); and FSA implementing regulations, Environmental Quality and Related Environmental Concerns – Compliance with NEPA (7 CFR Part 799). The intent of NEPA is to protect, restore, and enhance the human environment through well informed Federal decisions. A variety of laws, regulations, and Executive Orders (Eos) apply to actions undertaken by Federal agencies and form the basis of the analysis presented in this PEA.

Those regulations include, but are not necessarily limited to:

- Endangered Species Act (ESA) of 1973, as amended (16 USC 35 parts 1531 et seq., 1988)
- Migratory Bird Treaty Act
- Clean Water Act (33 USC 26 parts 1251 et seq., 2000)
- Clean Air Act (42 USC 85 parts 7401 et seq., 1999)
- National Historic Preservation Act (54 USC 300101 et seq., 2014) and associated Section 106 process (54 USC 306108, 2014)
- Archaeological Resources Protection Act
- Pollution Prevention Act
- EO 11514, Protection and Enhancement of Environmental Quality (35 Federal Register [FR] 4247, 1977)
- EO 11988, Protection of Floodplains
- EO 11990, Protection of Wetlands
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low- Income Populations (59 FR 32, 1995)

1.6 PUBLIC INVOLVEMENT

In accordance with NEPA, a federal agency must coordinate with other Federal and state agencies with an interest in the Proposed Action or resources potentially affected by that action as well as concerned public. The proposal for establishing a groundwater CREP in the Harney Basin began in 2017. Harney County, through the Community-Based Water Planning Program (CBWP), invited water users from the East Snake River Plains Aquifer to discuss efforts in their basin to reduce groundwater use to protect listed fish species. The presentation identified CREP as an important tool to assist agricultural landowners in coping with declining groundwater levels. The Agricultural Work Group (AWG) of the CBWP explored CREP programs from Colorado, Kansas, Nebraska, and Idaho that address groundwater conservation and had discussion about whether CREP was an approach appropriate for the Harney Basin.

Discussions with State of Oregon agencies involved in water resources (Oregon Water Resources Department), conservation funding (Oregon Watershed Enhancement Board), agricultural sustainability (Oregon Department of Agriculture), and aquatic resources (Oregon Department

of Fish and Wildlife) were conducted to further explore the potential. Discussion of the CREP concept was held with irrigators in the basin and with the CBWP collaborative group in public meetings between 2018 and 2021. A Technical Work Group was organized by the Oregon Watershed Enhancement Board which met eight times between April 2019 and January 2021.

A PEA Scoping meeting was held August 10, 2022, to describe the proposal and solicit public input on the alternatives to be considered and the issues to be evaluated in the PEA. The meeting was held at the Harney County Community Center and made available through a virtual connection. Comments on the PEA scope was held open until May 26, 2023.

In accordance with NEPA, the Draft PEA will be made available for public and agency review for a period of 30 days.

1.7 ORGANIZATION OF THE PEA

This PEA assesses the potential impacts of the Proposed Action and the No Action Alternative on potentially affected environmental and economic resources.

- **Chapter 1** provides background information relevant to the Proposed Action and discusses its purpose and need.
- **Chapter 2** describes the Proposed Action, alternatives considered, and the No Action Alternative.
- **Chapter 3** describes the baseline conditions (i.e., the conditions against which potential impacts of the Proposed Action and alternatives are measured) for each of the potentially affected resources.
- **Chapter 4** describes the potential environmental consequences to the resources described in Chapter 3.
- **Chapter 5** describes cumulative impacts.
- **Chapter 6** describes mitigation measures**.**
- **Chapter 7** list the preparers of this document
- **Chapter 8** lists the persons and agencies consulted.
- **Chapter 9** contains references.

CHAPTER 2 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

On behalf of the CCC, FSA proposes to implement a CREP Agreement (Agreement) in the groundwater use area of Harney Basin in the State of Oregon (Appendix A). The Agreement would authorize the enrollment of up to 20,000 acres of groundwater irrigated cropland within Harney County. The Proposed Action would include establishing contracts with producers of eligible lands in order to implement approved conservation practices (CPs). Producers would receive support for the costs of installing and maintaining the practices as well as annual rental payments for lands enrolled in the program. Oregon would provide payments for the voluntary cancellation of the associated water rights and one-time incentive payments for groundwater dependent ecosystem benefits and costs for well abandonment. Producers would also be able convert well water use from irrigation to livestock water. The estimated cost of the HVG CREP program is $58,642,470 over 15 years upon full enrollment. The primary objectives of the Harney Basin CREP are to:

- Reduce agricultural use of the confined and unconfined aquifer in the Harney Basin by approximately 40,000-50,000 acre-feet of groundwater per year (16 percent water savings within the Basin).
- Establish up to 20,000 acres of habitat for numerous wildlife species.
- Reduce fertilizer and pesticide application by approximately 20 percent over the CREP Area and eliminate the need for herbicides except to control weeds in the conservation plantings and fertilizer on all enrolled acres.
- Establish up to 20,000 acres of native or naturalized vegetation throughout the CREP Area.
- Reduce soil erosion from approximately 681,252 tons to approximately 149,487 tons per year on all acres enrolled in CREP.
- Reduce energy consumption at all enrolled farms from reduced pump use.

2.1.1 Acreage and Geographic Area

The proposed CREP Area is within the GHVGAC in Harney County, Oregon (Figure 2-1). Under the Agreement, up to 20,000 acres of groundwater irrigated cropland would be enrolled in the program. There are approximately 95,000 acres of irrigated land within the total CREP Area. Groundwater levels have declined significantly in a number of areas throughout the GHVGAC. Reducing groundwater irrigation and agricultural production in this area would provide the greatest benefit to the aquifer.

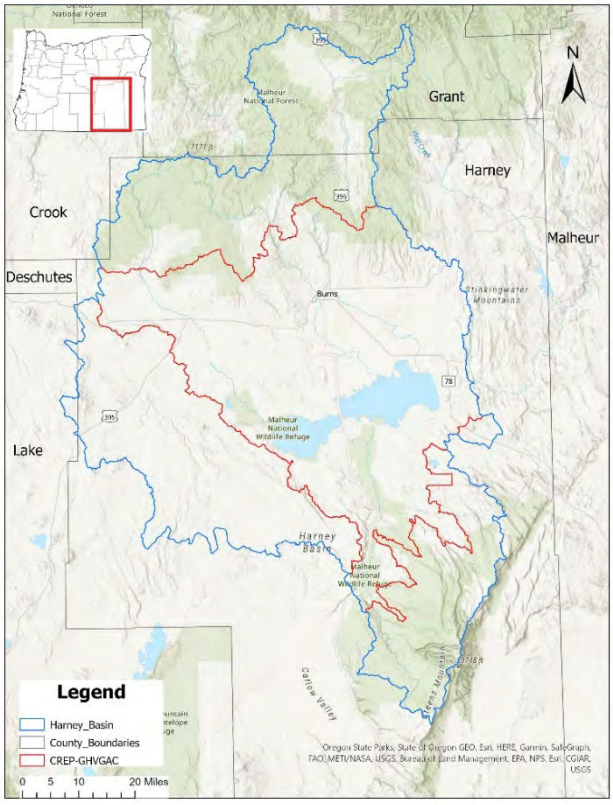


Figure 2-1: Greater Harney Valley Groundwater Area

2.1.2 Conservation Practices

The proposed CPs for the Harney Basin CREP Proposal are provided in Table 2.1-1. Also provided in Table 2.1-1 are the estimated acreages to be enrolled by practice. The actual acres enrolled, and the CPs established, would be determined by FSA and Natural Resources Conservation Service (NRCS) technical staff through an assessment of the best practice for a particular enrollment area. A full description of each practice can be found in FSA Handbook: *Agricultural Resource Conservation Program for State and County Offices* (2-CRP, Revision 6).

Table 2.1 1. Proposed CPs for Harney Valley Groundwater CREP

Practice	Description	Estimated Acreage Enrollment
CP1	Establishment of Permanent Introduced Grasses and Legumes	15,000
CP2	Establishment of Permanent Native Grasses	2,000
CP4D	Permanent Wildlife Habitat Non-easement	2,000
CP23/23A	Wetland Restoration, Floodplain and Non-Floodplain	1,000
Total		20,000

Preparation of lands for the installation of CPs may include the following approved actions as determined by FSA or NRCS technical staff:

- Planting of temporary vegetative cover;
- Application of nutrients, minerals, and seed;
- Application of approved herbicides and pesticides;
- Planting of tree and shrub seedlings;
- Installation of animal damage control devices such as tree shelters, netting, and plastic tubes;

Temporary irrigation during the first two to three years of enrollment to establish a viable cover would be allowed under a temporary authorization from OWRD if determined necessary, but not to exceed 1.0 acre-foot per acre/year total for the first three years. Also, in accordance with FSA National policy, maintenance of the CPs would be required for the duration of the contract as well as periodic management of the CPs as described in the Conservation Plan. A focus of the maintenance and management would be the control of noxious weeds. The maintenance and management practices would be done to ensure the goals and benefits of the CP are being met.

2.1.3 Harney Valley Groundwater CREP Proposal Summary

The proposal submitted by Oregon (Appendix B) outlines the specifics of the program. Table 2.2.-2 summarizes the proposed program as detailed in the Draft Agreement. The State of Oregon, acting through the Oregon Water Resources Department, will be responsible for determining all matters associated with water rights. The Department will make determinations of eligibility by evaluating groundwater use, water right status and other elements necessary to accomplish the State desired outcomes. The Department will assign staff to service the program and work closely with FSA to ensure enrollments meet the desired objectives.

Table 2.1-2. Proposed Harney Valley Groundwater CREP Agreement	
Acreage	20,000 acres of groundwater irrigated land
CREP Duration	15 years
Funding	Federal contract for conservation rental and 50% of conservation cover costs, State contract for voluntary cancellation of water right and incentives for well abandonment costs and groundwater dependent ecosystem protections. Total costs with full enrollment is estimated to be $58,642,470.
Geographic Area	Greater Harney Valley Groundwater Area of Concern
County	Harney County, Oregon
Conservation Practices *(Estimated acreages)*	• CP-1 Permanent Introduced Grasses and legumes (15,000 acres) • CP-2 Permanent Native Grasses (2,000 acres) • CP4D Wildlife Habitat non-easement (2,000 acres) • CP23 & 23A Wetland Restoration & Wetland Restoration, Non-Floodplain (1,000 acres)
Contract Duration	14 to 15 years
Cost Share	Up to 50% cost share for establishing required cover

2.2 Alternatives

There are two alternatives to the proposed action that have been considered, a 15,000-acre alternative that did not require voluntary cancellation of water rights and a no action alternative.

2.2.1 Alternative 1 (15,000 Acre Alternative)

An alternative to enroll up to 15,000 acres with an option to voluntary cancel the associated water right was discussed in the community. The alternative would be available in the same geography as the proposed action and the same suite of CP's would be eligible. The primary difference would be the option to enroll for the contract period and retain the associated water right allowing resumption of irrigation following the contract period. While this alternative was attractive to many producers, it does not address the critical environmental concern of the State of Oregon which is the overallocation of groundwater and declining water levels from groundwater irrigation.

2.2.1 No Action

Under the No Action Alternative, the Agreement would not be implemented. CRP and other conservation programs would continue to be available for producers; however, the additional benefits of the proposed Agreement would not be realized. Conditions of the aquifer would continue to decline ultimately hindering long-term sustainability of the groundwater supply in this area and the long-term viability of the regional agriculture-based economy.

2.3 Alternatives Not Evaluated

During the scoping meeting of August 10, 2022, two alternatives were suggested for consideration. The first was to convert groundwater irrigated alfalfa to the production of native grasses for seed production. It was stated that such a conversion would use only approximately half the water of that necessary for alfalfa. While there would be water savings, upon exploration of the concept the likelihood of much more than 100+ acres would be the limit for the market for native grass seed. The conclusion is that this is not an alternative that could achieve the State Environmental objective of significantly reducing groundwater use.

A second alternative proposal discussed was to develop a program around diminishing the water rights for groundwater use. This alternative was discarded when it was determined that under current Oregon Water Law and administrative rules there is no legal pathway for the diminishment of a groundwater right.

2.4 RESOURCES ELIMINATED FROM ANALYSIS

CEQ regulations (40 CFR 1501.7) state that the lead agency shall identify and eliminate from detailed study the issues which are not important, or which have been covered by prior environmental review, narrowing the discussion of these issues in the document to a brief presentation of why they would not have a dramatic effect on the human or natural environment. In accordance with this regulation, the following resources have been eliminated from further analysis in this PEA:

Traffic and Transportation. Implementing the Agreement would not increase or decrease the demand for state-wide or local transportation, nor would it have any effect on current traffic conditions.

Noise. Implementing the Agreement would not permanently increase ambient noise levels at, or adjacent to, the CREP Area. Increased noise levels associated with implementing or maintaining CPs would be minor, temporary, and similar to existing noise on active farms.

Air Quality. The proposed action is not expected to impact either local or regional air quality. The project area attains the National Ambient Air Quality Standards (NAAQS) standards for all criteria pollutants (USEPA 2012b). The general conformity requirements and thresholds only apply to criteria pollutants in the Region of Influence (ROI) which are in nonattainment or maintenance of the NAAQS. Harney County is not in an Air Quality Maintenance Area or Nonattainment Area (DEQ, 2018).

Human Health and Safety. Implementing the Agreement would not appreciably affect human health and safety. While installation of CPs would pose a safety risk, this risk would be the same if the land remained in active agricultural production.

Coast Zones/Coastal Barriers. While Oregon is a coastal state, Harney County is separated from the Coastal Zone and any Coastal Barriers by two mountain ranges.

Other Formally Classified Lands. The proposed CREP Area does not include any Wild and Scenic Rivers, National Natural Landmarks, Wilderness Areas, National Forests, National Parks, National Monuments, or National Grasslands. The CREP area does include the Malheur National Wildlife Refuge however, the CREP proposal will not apply to refuge lands. In addition, these areas would not be eligible for enrollment in CREP; therefore, the action does not have any potential to impact these types of areas.

2.5 EVALUATION OF ALTERNATIVES

A brief summary of the potential impacts for the Proposed Action, Alternative 1 (15,000 Acre Alternative) and the No Action Alternative are provided in Table 2.5-1. Section 4.0 provides the full analysis for each of these resource areas.

Table 2.5-1 Evaluation of Alternatives

Resource	Proposed Action	Alternative 1 (15,000 Acres)	No Action Alternative
Biological Resources	• Short-term impacts to wildlife (in the form or disturbance or displacement) from construction activities associated with installing CPs are expected. • Long-term benefits to wildlife, including protected species, are expected from the increase and enhancement of wildlife habitat. • Improved water quality from the decrease in agricultural run-off would have a long-term positive impact to the aquifer. • Protected species would not be impacted. The site-specific evaluation would identify the presence of a protected species or critical habitat; consultation would occur with U.S. Fish and Wildlife Service (USFWS) or CPW as appropriate to ensure their protection.	• Short-term impacts to wildlife (in the form or disturbance or displacement) from construction activities associated with installing CPs are expected. • 15-year benefits to wildlife, including protected species, are expected from the increase and enhancement of wildlife habitat. • Improved water quality from the decrease in agricultural run-off would have a 15-year term positive impact to the aquifer. • Protected species would not be impacted. The site-specific evaluation would identify the presence of a protected species or critical habitat; consultation would occur with U.S. Fish and Wildlife Service (USFWS) or CPW as appropriate to ensure their protection.	• The additional long-term benefits to biological resources would not occur under the No Action Alternative. Producers would still be able to enroll lands in other conservation programs.
Water Resources	• Reducing irrigation in the CREP Area would have long-term beneficial impacts to ground water quantity and quality. • Reducing chemical inputs and nutrients in runoff would improve local surface water conditions.	• Reducing irrigation in the CREP Area would have 15-year beneficial impacts to ground water quantity and quality. • Reducing chemical inputs and nutrients in runoff would improve local surface water conditions over the 15-year lifetime of the program.	• While producers would still be able to enroll lands in other conservation programs, the additional benefits to water resources from the Harney Basin CREP would not be realized. Agricultural production would continue to deplete ground water for irrigation and degrade water quality.

Soil Resources	• Establishing permanent cover would stabilize soils on enrolled acres and reduce erosion potential. Reducing erosion would also reduce sedimentation in nearby surface waters and improve water quality. • Temporary impacts to earth resources would occur during establishment of CPs from tilling and grading activities; however, this disturbance would be similar in nature to the existing agricultural disturbance. • No impacts to topography or geology are expected.	• Establishing 15-year cover would stabilize soils on enrolled acres and reduce erosion potential over the term of the contract. • Temporary impacts to earth resources would occur during establishment of CPs from tilling and grading activities, which would be repeated if and when the land was returned to crop production. • No impacts to topography or geology are expected.	• Continuing active agricultural production would continue to routinely disturb soils and make the land susceptible to erosion. Producers would still be able to enroll lands in other conservation programs.
Cultural Resources	• No impact to cultural resources is expected to occur. • Site-specific evaluation would determine if an area has a higher potential to encounter an unknown cultural resource. Consultation with the State Historic Preservation Officer would occur, as appropriate, during the site-specific evaluation. • In accordance with FSA policy as found in Handbook 1-EQ (Revision 3), enrollment would not be approved if a cultural resource impact would occur.	• No impact to cultural resources is expected to occur. • Site specific evaluations would be the same as the proposed action.	• Continuing active agricultural production would not change existing impacts, if any, to cultural resources.
Recreation	• Long-term benefits to water quality and improving wildlife habitats would have long-term beneficial impacts to recreation in the CREP Area.	• 15-year benefits to water quality and improving wildlife habitats would have short-term beneficial impacts to recreation in the CREP Area.	• Continuing active agricultural production would not affect recreation in the CREP .

Socioeconomics	• Implementing the Harney Basin CREP would potentially provide up to $59 million to the local area in the form of annual rental payments, cost share, and incentives where applicable. • While a producer may likely incur a positive financial impact, those same positive impacts would not likely flow down to the local economy. Removing agricultural land from active production would have corresponding decreases in farm expenditures (seed, chemicals, equipment, etc.). • Conversely, it has been noted that decreasing the agricultural supply in an area could have corresponding increases in commodity prices. • Reducing irrigation would have long-term beneficial impacts to groundwater supply, thereby sustaining the primary industry of the regional economy.	• The proposal would provide less funding to the local economy over the life of the contracts. • Impacts to landowners would be limited to the 15 years of the contract life. • There would be little or no long-term change in groundwater use from this alternative potentially subjecting landowners of junior water rights to lose their ability to pump groundwater through regulation. • Removing agricultural land from active production would have corresponding decreases in farm expenditures (seed, chemicals, equipment, etc.).	• The No Action Alternative would not change the existing socioeconomic conditions. • Further depletion of groundwater could result in designation of a Critical Groundwater Management Area and curtailment of junior water users resulting in immediate halting of agricultural production for those users. • Removing agricultural land from active production would have corresponding decreases in farm expenditures (seed, chemicals, equipment, etc.).
Environmental Justice	• Almost all of Harney County within the proposed CREP Area is considered a low-income population. Removing large areas of active agricultural production for CREP in this county may have greater economic impacts to the low-income populations. Effects on the Burns Paiute Tribal reservation and other Tribal allotments are not expected to occur.	• There would be less benefit to low-income participants to the program because of lower conservation rental and continued potential for regulatory actions that could curtail use of groundwater for irrigation..	• Increasing uncertainty over groundwater use regulation will disadvantage low-income and small landholders.

CHAPTER 3 AFFECTED ENVIRONMENT

This chapter provides a description of the existing environment that could be affected by the proposed Agreement. Resource areas potentially affected and included in this analysis include:

- Biological Resources (Wildlife, Vegetation, and Special Status Species)
- Water Resources (Ground Water, Surface Water, Water Quality, and Wetlands)
- Earth Resources (Geology, Topography, and Soils)
- Cultural Resources
- Recreation
- Socioeconomics
- Environmental Justice

3.1 BIOLOGICAL RESOURCES

Biological resources include plant and animal species and the habitats within which they reside For this analysis, these resources are divided into three categories: wildlife, vegetation, and special status species. Vegetation and wildlife refer to the plant and animal species, respectively, both native and introduced, which characterize a region. Special status species are those species that are protected under federal or state laws.

The biological resources of the Proposed Action area is entirely in Harney County, Oregon. Detailed groundwater resource studies have been completed (Garcia et al, 2022 and Gingerich et al., 2022) for the basin. Documentation of Groundwater dependent ecosystems within the Proposed Action Area has been completed by Albano et al., 2020 and Freed et al., 2022). These studies and reports compile what is known about the groundwater dependent ecosystems affected by groundwater use in the Proposed Action area.

3.1.1 Wildlife

Wildlife and fisheries refer to the animals and fish that inhabit the project area and the habitats where they live. Oregon Department of Fish and Wildlife (ODFW) has legal authority over Oregon's fish and wildlife. The Malheur National Wildlife Refuge (MNWR) lies in the center of the GHVGAC. With more than 320 bird species, and 58 mammal species, MNWR is a mecca for birdwatchers and wildlife enthusiasts. Beyond the MNWR, flood irrigated wet meadows in the Silvies River floodplain provide migratory feeding and resting area for hundreds of thousands of geese and other waterbirds. An active collaborative effort to manage the flood irrigated wet meadows and improve the water quality of Malheur Lake is ongoing (HBWI, 2013). These surface water flood irrigated lands would not be eligible for the proposed HVG CREP.

The area of the Harney Basin that is subject to the Groundwater CREP was dominantly sagebrush steppe or greasewood flats before being cleared for agricultural production. Sage dependent wildlife include Greater sage grouse, sagebrush sparrow, mountain quail, loggerheaded shrike, common nighthawk, short eared owl, western meadowlark, Swainson's hawk, ferruginous hawk, sage thrashers, Brewer's sparrow, and other birds. Mammals associated with sage habitats include pronghorn, kit fox, badger, white-tailed jackrabbit, Mule Deer, and ground squirrels. Ground squirrels are common in alfalfa fields and are the primary prey for Swainson's hawks and other raptor predators.

3.1.2 Vegetation

Ecoregions are defined as areas of relatively homogenous ecological systems that contain similar soils, vegetation, climate, and geology. North America is divided into four levels of ecoregions and these ecoregions are further divided into divisions and provinces. The proposed CREP Area

is within the Northern Basin and Range. The Northern Basin and Range ecoregion is a Level III ecoregion designated by the United States Environmental Protection Agency (EPA). It contains dissected lava plains, rolling hills, alluvial fans, valleys, and scattered mountain ranges in the northern part of the Great Basin. Although arid, the ecoregion is higher and cooler than the Snake River Plain to the north and has more available moisture and a cooler climate than the Central Basin and Range to the south. Its southern boundary is determined by the highest shoreline of Pleistocene Lake Bonneville, which once inundated the Central Basin and Range. The western part of the region is internally drained, its eastern stream network drains to the Snake River system. The valleys support sagebrush steppe or saltbush vegetation. Mollisol soils are common, in contrast to the aridisols of the Central Basin. Juniper-dominated woodland occurs on rugged, stony uplands. The mountain ranges are covered in mountain sagebrush, Idaho fescue, Douglas-fir, subalpine forests, or aspen.

The CREP area is dominantly in the floodplain and pluvial lake basin portion of the ecoregion (Bailey 1995, Thorson et al., 2003). The Pluvial Lake Basins ecoregion (Level IV) contained vast lakes during the Pleistocene epoch that have now mostly disappeared. It is characterized by gently sloping, internally drained basins with lake terraces, playas, beach plains, stream terraces, intermittent lakes, fan skirts, and cool springs. Elevation varies from 4,200 to 6,200 feet (1,280 to 1,890 m). Some basin floor playas collect and evaporate water seasonally, but not as extensively as the High Desert Wetlands. Dry lake beds near the Cascade Mountains have a significant layer of volcanic ash. Greasewood, inland saltgrass, and seepweed grow in alkaline soils. Better drained, less alkaline soils are dominated by Wyoming big sagebrush and basin big sagebrush, with rubber rabbitbrush, Great Basin wildrye, bottlebrush squirreltail, Indian ricegrass, Sandberg's bluegrass, Thurber's needlegrass, and cheatgrass.

3.1.3 Groundwater Dependent Ecosystems

Within the GHVGAC groundwater dependent ecosystems of springs, and phreatophyte vegetation are most at risk. Groundwater dependent river reaches, lakes and wetlands are not as likely to be affected by the proposed action. While there is not widespread evidence of decline in groundwater dependent ecosystems, drying of Sodhouse Spring on the Malheur National Wildlife Refuge is an important indicator of the potential for adverse effects. There is a baseline of phreatophyte vegetation developed by Albano and others (2020). The location of springs and phreatophyte vegetation can be used to look at the potential effect of reduced groundwater pumping on the adjacent groundwater dependent ecosystems.

3.1.4 Special Status Species

Special status species refer to those species that are protected under the ESA or similar State laws. If associated with a Federally protected species, habitat is designated by the USFWS as critical habitat since it is essential for the recovery of the species. Like those species, critical habitat is also protected by the ESA. Malheur Wire-lettuce (*Stephanomeria malheurensis*) is a federally listed endangered plant species that occurs in the GHVGAC area. It is restricted to a single location on a hillside above Harney Lake, on soils derived from volcanic tuff and layered with thin crusts of limestone. It is not within any groundwater irrigated land eligible for enrollment in the HVG CREP.

Greater sage-grouse (*Centrocercus urophasianus*) is a "warranted but precluded" federal species subject to a cooperative conservation Plan (ODFW, 2011). The Burns population that occurs in the Harney Basin constitutes 16% to 19% of the state population of sage-grouse. The Oregon Conservation Strategy states:

> "Permanent conversion of sagebrush to agricultural lands is the single greatest cause of decline in sagebrush-steppe habitat in the Columbia Basin (Quigley and Arbelbide 1997). In

the northern half of eastern Oregon, large areas of sagebrush-steppe habitat have been converted to agricultural lands (Wisdom et al. 2002). Although sage-grouse will occasionally use agricultural lands (e.g., alfalfa) as late summer and late brood-rearing habitat, row crops and dryland cereal grains are generally not beneficial habitat (Swensen et al. 1987, Blus et al. 1989). In southeastern Oregon, most conversion occurred in the late 1800s to early 1900s, reached a threshold in the mid-1950s and has remained relatively unchanged since. However, the number of irrigated acres has increased slightly in some areas since the 1950s."

The Harney Basin has seen the least overall loss of sage habitats of the other assessment areas in Oregon. The Burns area has the greatest juniper expansion effect on sage-grouse habitat. Areas of irrigated agriculture in the Harney Basin are identified as negligible and low habitat viability for greater sage grouse (ODFW, 2011).

Monarch Butterfly (*Danaus plexippus*) is a candidate species that is dependent on milkweed. In July 2022 it was listed as endangered by IUCN Red List and "warranted but precluded" by the U.S. Fish and Wildlife Service in December 2020. Monarch butterfly do not use alfalfa which is the dominant crop using groundwater irrigation.

A list of bird species of concern as identified in Birds of Conservation Concern 2021 (U.S. Fish & Wildlife Service, 2021) in the basin is detailed in Appendix C.

The lands involved with this CREP proposal are all actively farmed fields irrigated by groundwater. The predominant crop is alfalfa which provides some feed for pronghorn, mule deer, and other grazers.
Ground squirrels are common in alfalfa fields and provide prey for hawks and badgers.

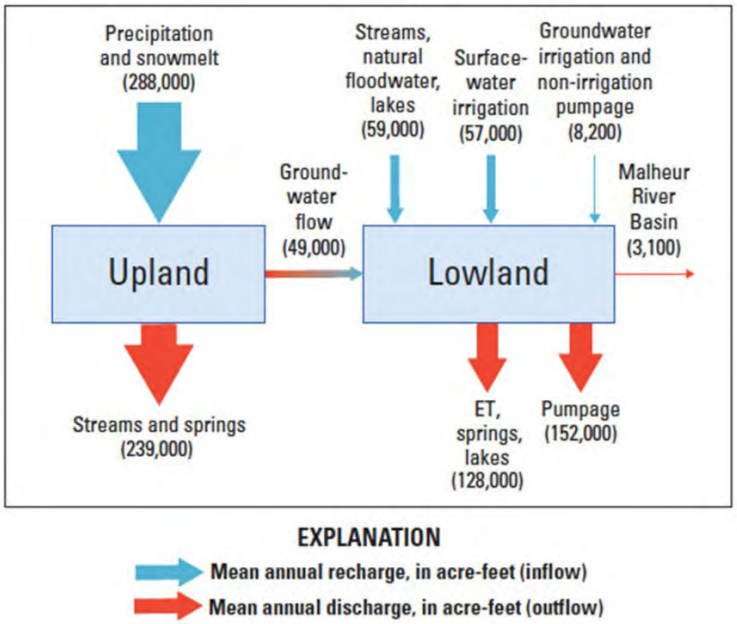
3.2 WATER RESOURCES

For this analysis, water resources include groundwater, water quality, and wetlands. The Clean Water Act, the Safe Drinking Water Act, and the Water Quality Act are the primary Federal laws that protect the nation's waters including lakes, rivers, aquifers, and wetlands. The state of Oregon manages water quantity through the Oregon Water Resources Department and water Quality through the Oregon Department of Environmental Quality.

3.2.1 Ground Water

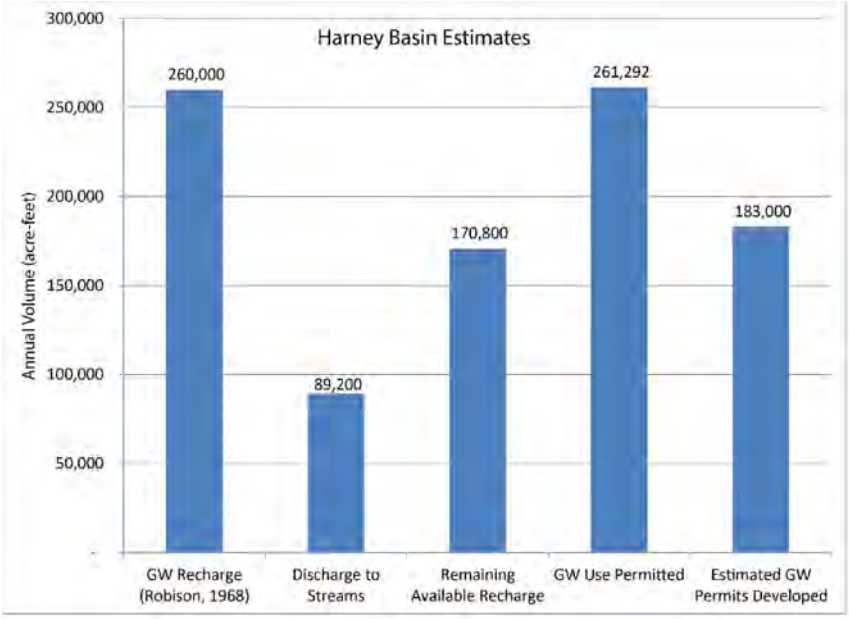
Groundwater in the Harney Basin occurs within a single groundwater-flow system that includes several distinct yet hydraulically connected areas distinguished by local hydrostratigraphy, location in the basin-wide groundwater-flow system, and local rate and magnitude of recharge and discharge (Gingerich et al., 2022). Groundwater recharge in the Harney Basin lowlands occurs mostly by infiltration of surface water through lowland stream channels and flooded areas. Modern recharge is generally limited to a thin, shallow zone beneath lowland recharge areas. There is little direct recharge from precipitation in the lowlands, and evapotranspiration is significantly greater than precipitation across the valley bottom. The deeper groundwater (generally below 100 feet) is significantly older and is the primary source for irrigated agriculture. Deeper groundwater is recharged over centuries or millennia. Gingerich et al, (2022) details the groundwater resources of the Harney Basin and Garcia et al., (2022) describes in detail the groundwater budget of the Harney basin. The studies document that the groundwater budget in the lowland area (Greater Harney Valley) is out of balance by an estimated 110,000 acre-feet/year (Figure 3.2.1) .

Figure 3.2.1 Groundwater Budget for the Harney Basin (*from Garcia et al., 2022*)



A primary driver for the Harney Basin Groundwater Study and the development of the CREP concept through the Community-Based Planning project is in response to the over allocation of groundwater rights. Figure 3.2.2 summarizes the conditions that led to the 2015 designation of the GHVGAC. The estimate at the time showed permits for 261,292-acre feet of water and an estimated annual recharge of approximately 170,800 acre-feet The recent study has documented a more refined estimate of the groundwater budget.

Figure 3.2.2 Harney Basin Groundwater Budget Estimate (*from OWRD 2015*)



The resulting effect of groundwater use has been expressed as serious decline in groundwater levels in some areas of the Harney Basin (Figure 3.2.3 and 3.2.4). A community-based plan for managing groundwater has been drafted as a part of an Integrated Water Resource Plan for the Harney Basin (Harney Community Based Water Planning Collaborative, 2022).

Figure 3.2.3 Groundwater Level Declines in Weaver Springs Area (*from OWRD*)

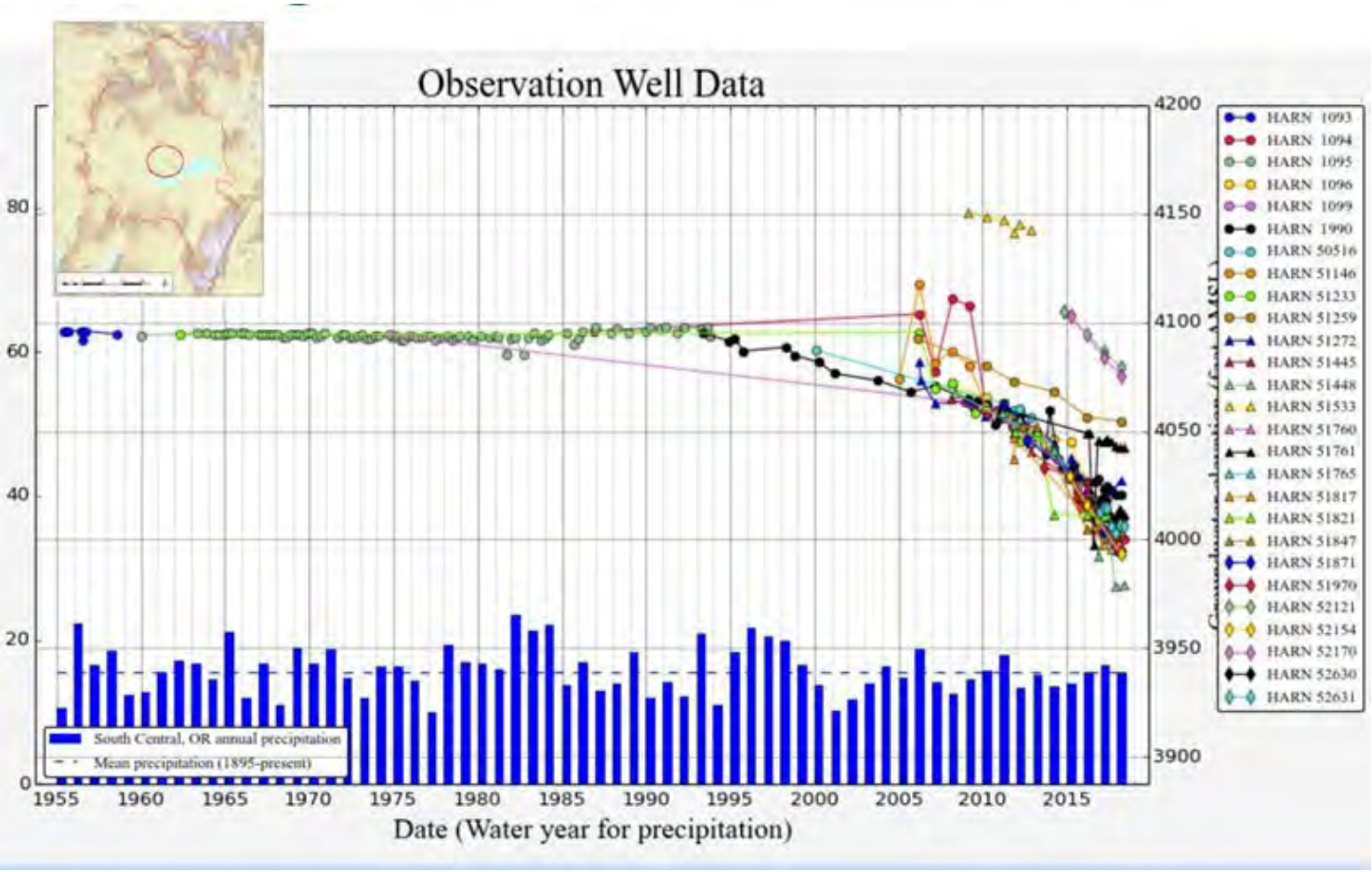
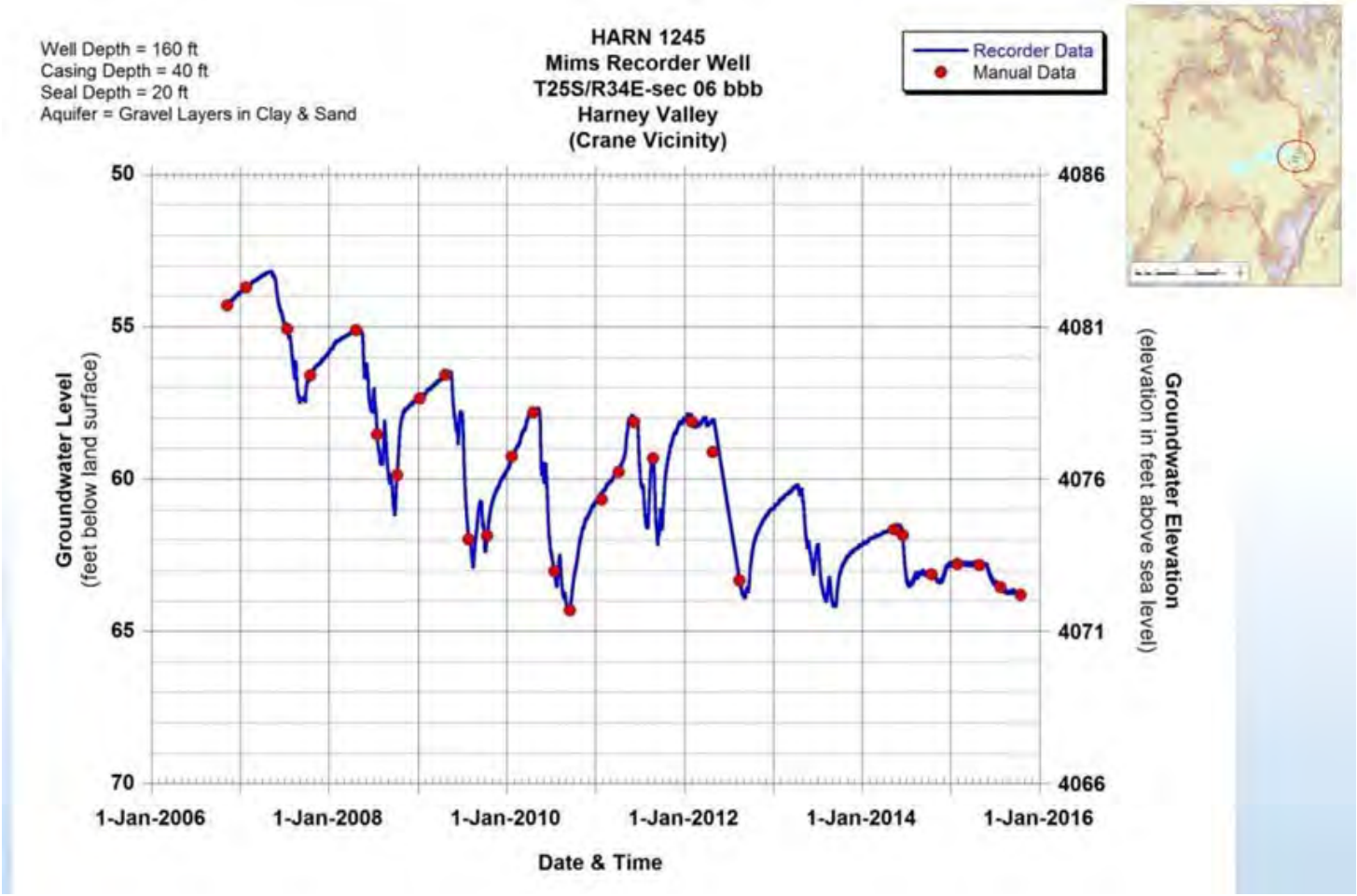


Figure 3.2.4 Groundwater Level Declines in Crane Area (*from OWRD*)



3.2.2 Surface Water

The Harney Basin covers 5,245 square miles (Table 3.2.1). The Silvies River and Silver Creek drain south from the Blue Mountains and the Donner und Blitzen River drains north from Steens Mountain. All surface drainage flows towards Malheur and Harney Lakes. Rainfall average in the central part of the basin is 6 to 9 inches per year with precipitation of up to 50 inches per year in the mountains, primarily from snowfall.

Table 3.2.1 Watersheds of the Harney Basin

Watershed	Area (acres)	Area (square miles)
Silver Creek	1,086,400	1,697.5
Silvies River	814,900	1,273.3
Donner und Blitzen	506,300	791.1
Harney Malheur Lakes	949,700	1,483.9
Harney Basin	**3,375,300**	**5,245.8**

Surface water in the Harney Basin has been fully allocated for more than five decades. Surface water irrigation is dominantly flood irrigation of wet meadow pastures that provide both forage for cattle and is critical for resting and feeding habitat for migratory waterbirds.

3.2.3 Water Quality

Oregon Department of Environmental Quality has limited information of surface water quality conditions in the basin. The data is summarized in a water quality index for three monitoring sites (Table 3.2.2). The data indicates that on a very broad scale, surface water quality is good to excellent. The primary water quality limitation is temperature with many stream segments failing Oregon water quality standards for cold water fisheries.

Table 3.2.2 Surface Water Quality Data (DEQ, 2017)

Oregon Department of Environmental Quality

OWQI Basin Summary

Station	Location Description	Land Use	Water Year Range	OWQI Score	OWQI Status	OWQI Trend and Magnitude		10 Year OWQI Trend - Includes data from 1981-2015	Sub-Index Status and Trend							
									Temp	pH	DO	BOD	TS	N	P	Bact
HARNEY BASIN																
12265	Donner & Blitzen River at Page Springs Campground	Range	2013-17	91	Excellent	-		Insufficient Data								
13014	SF Blitzen R at Blitzen Crossing	Range	2013-17	92	Excellent	-		Insufficient Data								
33929	Silvies River at West Loop Road	Range	2013-17	85	Good	-		Insufficient Data								

Status
- = Excellent (90-100)
- = Good (85-89)
- = Fair (80-84)
- = Poor (60-70)
- = Very Poor (10-59)

Trend
- ↑ = Improving Trend
- NT = No Trend
- ↓ = Declining Trend
- NA = Insufficient Data

Sub-Index
- **Temp** = Temperature
- **pH** = pH
- **DO** = Dissolved Oxygen
- **BOD** = Biochemical Oxygen Demand
- **TS** = Total Solids
- **N** = Nitrogen
- **P** = Phosphorus
- **Bact** = Bacteria (e.coli)

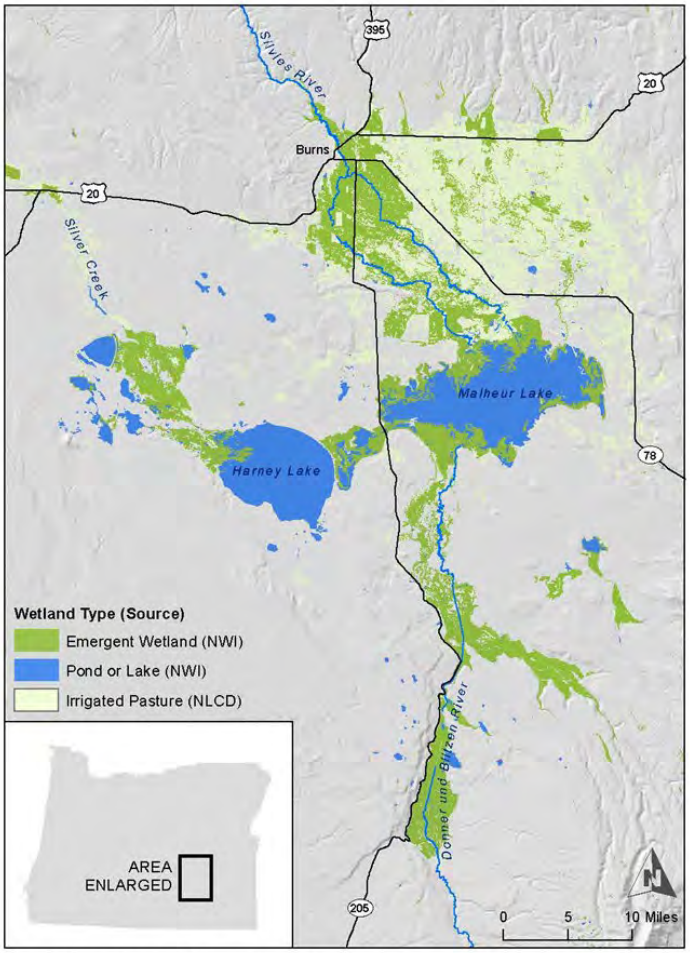
A summary of groundwater quality was completed in 2021 from sampling in 2018. Groundwater quality is variable with areas of high levels of arsenic, iron, boron and a few other natural materials. Almost no incidences of *E. coli* or agricultural chemicals were detected in the samples (Haxton-Evans and Brown, 2021). Arsenic has been documented from some areas in the basin at levels higher than recommended for human consumption (Smitherman, 2015).

3.2.4 Wetlands

Wetlands in the Harney Basin are associated with the Malheur National Wildlife Refuge and flood irrigated wet meadow pastures in the Silver Creek, Silvies River, and Donner und Blitzen River floodplains (Figure 3.2.3). The Harney Basin Wetlands Initiative is a collaborative effort to maintain the flood irrigated wet meadows for ranching and migratory bird habitat and to improve the water quality of Malheur Lake. The groundwater irrigated areas of the basin typically did not support wetlands.

There is little opportunity to restore wetlands with the reduction of groundwater irrigation.

Figure 3.2.5 Harney Basin Wetlands



Extent of type of wetlands in the Harney Basin, Oregon. Produced in the U.S. Fish and Wildlife Division of Realty and Refuge Information, Portland, OR. 9/16/2014. File 14-131-1.MXD.

3.3 SOIL RESOURCES

For the purposes of this PEA, soil resources are defined as underlying geology, topography, and soils. Topography describes the elevation and slope of the terrain, as well as other visible land features. Soils are defined as the unconsolidated mineral and organic material on the immediate surface of the earth that serves as a natural medium for the growth of land plants (NRCS 2012a). Soils are included in this PEA because implementation of the CPs associated with the Proposed Action could impact soil resources within GHVGAC.

3.3.1 Geology and Topography

As described in the USDA Soil Survey (USDA, 2006) "The Greater Harney Valley area lies within the Basin and Range Physiographic Province. Harney Basin is the northernmost extent of this physiographic province. The northern part of the survey is in the Blue Mountains Province. The northwestern part of the survey area is in the High Lava Plains Province (Orr and Ewart, 1992). The uplands of the survey area are mostly Tertiary tuff, basalt, and andesite with a few islands of older igneous rock. The valleys consist of Quaternary alluvium. Steens Mountain is dominantly Miocene basalt flows, which were dramatically uplifted in a fault block. During the Pleistocene, Steens Mountain was sculpted by alpine glaciation."

The Basin and Range Province is characterized by basins that have closed or partially closed drainage systems and are separated by north-south trending fault-block mountain ranges. In the lowest part of the basin are dry salt flats and shallow saline playa lakes. The soils on lakebeds and terraces adjacent to these lowest areas are those of the Alvodest, Boravall, Icene, and Mesman series. During the Ice Age, large lakes filled the basin. Evidence of ancient shoreline is as much as 200 feet above the present floor of the basin (Snyder and Zdenek, 1964). Many of the nearly level lake terraces in the basin are now being farmed. The soils on these ancient lake terraces include those of the Lawen, Outerkirk, Kegler, Reallis, Enko, and Windybutte series. The floor of the basin is at an elevation of about 4,000 to 4,500 feet.

3.3.2 Soils

Soils within GHVGAC includes a group of "Cool Soils on Lake Terraces, Lake Plains, and Fans" which consist of well drained, very deep soils that are formed in alluvium on lake terraces and fans. Another group, "Cool Soils on Shrub- and Grass-Covered Plateaus, Hills, and Mountains" that receive 8 to 16 Inches of precipitation consists of well drained, shallow and moderately deep soils that formed in alluvium and colluvium; on "Plateaus and Hills that receive 8 to 12 inches of precipitation (NRCS, 2006). Soils are associated with different portions of the landscape (Figure 3.2.4).

Figure 3.3.1 Soil and landscape relationship in Harney Basin (from NRCS, 2006)

3.4 CULTURAL RESOURCES

Cultural resources are prehistoric or historic sites, buildings, structures, objects, or other physical evidence of human activity or natural landscapes that are considered important to a culture or community for scientific, traditional, religious, or other reasons.

Section 106 of the National Historic Preservation Act of 1966, as amended, and as implemented by 36 CFR Part 800, requires federal agencies to consider the effects of their actions on historic properties before undertaking a project. A historic property is defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The NRHP, administered by the National Park Service, is the official inventory of cultural resources that are significant in American history, prehistory, architecture, archaeology, engineering, and culture.

There are a number of NRHP sites on the Malheur National Wildlife Refuge (U.S. Fish & Wildlife Service,2013). The area for the proposed Harney Basin CREP contains no historic properties included in the NRHP sinceit is private land where cultural resources surveys are not normally conducted.

3.4.1 Burns Paiute Tribe

Nearly all of the HVG CREP area is within the historic Malheur Indian Reservation which was established in 1872 and eliminated in 1879 by Presidential Order. Approximately 11,000 acres in 71 allotments were deeded to individual Tribal members under the Dawes Act of 1887. The Burns Paiute Reservation was established by Public Law 92-488 on October 13, 1972 and constituted two parcels; 761 acres purchased in 1933, and 10 acres donated in 1928. There is limited opportunity for the CREP program to affect either Tribal lands or Tribal cultural resources since the program is only applicable to actively cultivated lands.

3.5 RECREATION

Recreation includes those outdoor activities that take place away from the residence of the participant. Oregon offers a wide variety of recreational opportunities to its residents. Hunting, fishing, wildlife viewing, camping, hiking, and touring are important leisure time activities in the Harney Basin. The Harney County Migratory Bird Festival was first held in 1981 to celebrate the large annual migration of birds passing through Harney Basin on the Pacific Flyway. Harney Basin is one of the three most important areas left in the western United States for spring migratory birds stopping on their way north. Sponsored by the Harney County Chamber of Commerce, in cooperation with Malheur National Wildlife Refuge, Bureau of Land Management, U.S. Forest Service, Ducks Unlimited, Portland Audubon Society, Friends of Malheur National Wildlife Refuge, and many other groups, the Harney County Migratory Bird Festival has brought hundreds of visitors to the Harney Basin for a week in the spring (February 4-11, 2019). The Malheur Wildlife Refuge also attracts visitors to the basin throughout the year.

A survey of visitors to the Malheur National Wildlife Refuge (MNWR), as well as other refuges, was conducted from July 2010 – November 2011 with 276 surveys being completed (Sexton et al., 2012). The refuge attracts 65,000 visitors annually. Findings included: 1) only 4% of visitors lived within 50 miles of MNWR, 2) 80% came solely for visiting the refuge, 3) Nonlocal visitors traveled an average of 438 miles, and 4) 93% of visitors came for birdwatching.

The MNWR brings tourism to Harney County. Findings from this study related to tourism include: 1) Nonlocal visitors stayed in the local area (50 miles) for an average of 3 days; 2) Nonlocal visitors spent an average of $65 per person per day (minimum $0, maximum $375), while local visitors spent an average of $60 per person per day in the local area (minimum $8, maximum $155).

The Steens Mountain Cooperative Management and Protection Area (CMPA) consists of 428,156 acres of public land offering diverse scenic and recreational experiences. The CMPA encompasses an extraordinary landscape with deep glacier carved gorges, stunning scenery, wilderness, wild rivers, a rich diversity of plant and animal species, and a way of life for all who live there. The 52-mile Steens Mountain Backcountry Byway provides access to four campgrounds and the views from Kiger Gorge, East Rim, Big Indian Gorge, Wildhorse and Little Blitzen Gorge overlooks.

3.6 SOCIOECONOMICS

For the purposes of this PEA, socioeconomics includes investigations of farm and non-farm employment, income, and farm production expenses and returns. Most of the data used for the socioeconomic analysis is derived from the U.S. Census Bureau (USCB) and the National Agricultural Statistical Service (NASS). These datasets are collected every ten and five years, respectively. The data used in this section represents the most current, publicly available data. The 2017 Census of Agriculture identifies that there is 1,557,103 acres in agriculture and 532 individual farms in Harney County. Crop sales accounted for $29,601,000 (36 percent) and livestock sales represented $52,695,000 (64 percent) in market value of agricultural products from Harney County.[1]

[1] A significant amount of the following information is taken from Technical Memorandum: Harney Basin Groundwater Market Feasibility Study – Economic Appendix dated November 1, 2021, by ECONorthwest.

3.6.1 Harney County Employment

Total covered employment in Harney County is approximately 2,513 people (Table 3.6.1). Covered employment does not include self-employment or agricultural labor performed for a farm with a quarterly payroll of less than $20,000 or not employing at least 10 persons in each of 20 separate weeks during any calendar year. The "Agriculture, forestry, fishing & hunting" industry includes crop production and animal production. There are 14 entities for crop production that employ 120 people and 20 entities for animal production that employ 121 people.

Table 3.6.1 Employment in Harney County

Annual Covered Employment and Wages by Industry, Harney County (2020)				
Industry	**Entities**	**Employment**	**Wages**	**Average Annual Wage**
Agriculture, forestry, fishing & hunting	41	250	$8,947,615	$35,790
Construction	31	90	$3,346,315	$35,982
Manufacturing	2	Na	Na	Na
Trade, transportation and utilities	57	436	$16,323,817	$37,440
Information	4	Na	Na	Na
Financial activities	14	40	$1,415,669	$35,392
Professional and business services	24	125	$4,734,421	$37,875
Education and health services	43	234	$8,158,273	$34,864
Leisure and hospitality	30	273	$3,909,141	$14,319
Other services	20	56	$1,650,165	$29,467
Federal Government	14	241	$15,933,981	$66,116
State Government	8	112	$6,783,185	$60,564
Local Government	31	633	$29,830,922	$47,126
Total	**322**	**2,513**	**$101,620,185**	**$40,438**

Na = Indicates that information is not available due to confidentiality considerations. Entity is a any company, corporation, partnership association etc., that performs commercial activity in the county.

3.6.2 Farm Value, Employment and Income

The USDA Agricultural Census from 2017 estimates that there are 1,151 total agricultural laborers in Harney County – of which approximately half (625 workers) are unpaid (Table 3.6.2). The two largest private industries in the county are cattle ranching and farming and other crop farming. Together, those two industries comprise $95.9 million in economic output, representing 19 percent of the total output ($494 million) in Harney County. In addition to the direct employment, wages, and revenue from the agricultural sector, there are secondary economic contributions that the industry supports as their spending supports the suppliers that they and their employees purchase goods and services from. For every $1 million spent on crop farming in Harney County, there is an additional $345,553 in economic activity supported. On average, $1 million in spending by the industry supports a total of $286,200 in direct labor income and an additional $142,000 in labor income in secondary effects for things like farm suppliers, grocery stores, and other supply chain and household purchases.

Table 3.6.2 Agricultural Values in Harney County

Economic Variable	Value	
Ag land, cropland, harvested	173,533 acres	
Ag land, cropland, harvested, irrigated	141,991 acres	
		Per Acre Value
Commodity totals – sales, measured in $	$82,296,000	$474.24
Income, net cash farm, of operations – net income, measured in $	$20,142,000	$116.07
Taxes, property, real estate & non-real estate, (excl paid by landlord) – expense, measured in $	$2,753,000	$15.86
Labor, hired – number of workers	526	
Labor, unpaid – number of workers (Include unpaid non-operator partners or family members who are not operators)	625	
Total Labor	1,151	

Source: USDA National Agricultural Statistics Service, 2017 Census of Agriculture. (2017). County Profile: Harney County. Available at:
https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Oregon/cp41025.pdf

3.6.3 Farm Production from Irrigation

There are approximately 166,501 irrigated acres of land in Harney County used for agricultural production – including both surface water and groundwater irrigation. Out of those irrigated acres approximately 141,840 are used to grow hay or haylage. Table 3.6.3 summarizes acres for irrigated hay and haylage in the county. Approximately 42 percent of all irrigated agriculture in the Harney County is for alfalfa production.

Table 3.6.3 Hay Production in Harney County

Hay Production in Harney County			
Fodder Production	**Acres Total**	**Acres Irrigated**	**Percent Irrigated**
Hay, excluding Alfalfa	103,604	76,667	74%
Alfalfa	64,227	60,514	94.2%
Haylage	4,811	4,659	96.8%
Hay & Haylage	**172,642**	**141,840**	**82.2%**

Groundwater irrigated agriculture in Harney County is used to grow primarily alfalfa or meadow hay. High-quality alfalfa can be exported to be used as feed for dairy cows. Alfalfa is also used as a supplemental winter feed for livestock. Meadow hay is generally used as cattle feed and not exported out of the county. Meadow hay is less water intensive than alfalfa because it is limited to one cutting opposed to three to four cuttings for alfalfa (depending on weather conditions). Every six to ten years alfalfa land needs to be rotated and annual barley or oats are often grown in those rotation years as forage crops.

As of 2017 there was a total of $29.6 million in sales for crops and $52.7 million in sales for livestock in Harney County (Census of Agriculture, 2017). On average, a farm in Harney County has a market value of agricultural products sold of $154,691 and a net cash farm income of $37,861. Most farms in the Harney Basin are either managed on a part-time basis or as part of a business that runs several farms. Annual gross revenue received per farm varies significantly in terms of the gross revenue received with approximately one-third receiving less than $2,500 per year and one-third receiving more than $100,000 per year (Table 3.6.4).

Table 3.6.4 Harney County Farms by Value of Sales

Value of Sales	Number of Farms	Percent of Total
Less than $2,500	155	29%
$2,500 - $4,999	51	10%
$5000 - $9,999	46	9%
$10,000 - $24,999	52	10%
$25,000 - $49,999	33	6%
$50,000 - $99,999	32	6%
$100,000 or more	163	31%
Total	**532**	**100%**

3.6.4 Estimated Groundwater Irrigation Revenues

The estimated gross revenue from lands irrigated with groundwater is approximately $51.6 million. The estimated net cash farm income on these lands is $12.6 million. The estimated property tax payment from these lands is $1.7 million. The total property tax revenue in Harney County collected for 2019- 2020 was $2.6 million – meaning that property tax revenues from these properties is approximately 65 percent of total annual property tax collections. The total employment on these lands is 720 jobs based on the proportion of groundwater irrigated agriculture (108,760 acres) compared to total agricultural area (173,533). This level of employment is approximately 16 percent of total employment (4,353 jobs) in Harney County.

3.7 ENVIRONMENTAL JUSTICE

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires a federal agency to "make achieving environmental justice part of its mission by identifying and addressing as appropriate, disproportionately high human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." A minority population can be defined by race, by ethnicity, or by a combination of the two classifications. According to CEQ, a minority population can be described as being composed of the following groups: American Indian or Alaska Native, Asian or Pacific Islander, Black, not of Hispanic origin, or Hispanic and exceeding 50 percent of the population in an area or the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population (CEQ 1997). The U.S. Census Bureau (USCB) defines ethnicity as either being of Hispanic origin or being of non-Hispanic origin. Hispanic origin is further defined as "a person of Cuban, Mexican, Puerto Rican, South or Central America, or other Spanish culture or origin regardless of race" (USCB 2001). The USDA defines Environmental Justice as "the fair treatment and meaningful involvement of all people regardless of race, national origin, sex, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies". The USDA is

committed to environmental justice to work in collaboration with state, tribal and local government as well as non-governmental organizations and private individuals to address environmental conditions that may place communities at risk and to aid communities to achieve environmentally suitable conditions and healthier lives.

Each year the USCB defines the national poverty thresholds, which are measured in terms of household income and are dependent upon the number of persons within the household. Individuals falling below the poverty threshold are considered low-income individuals. USCB census tracts where at least 20 percent of the residents are considered poor are known as poverty areas (USCB 1995). When the percentage of residents considered poor is greater than 40 percent, the census tract is considered an extreme poverty area.

3.7.1 Demographic and Income Profile

The total population of Harney County is approximately 7,280 (as of 2020). On average, the population has a higher percentage of residents above the age of 65 compared to the statewide average (Table 3.7.1). There are approximately 3,244 households in Harney County with an average household size of 2.19 according to the 2019 U.S. Census.

Table 3.7.1 Harney County Population by Age Group (2020)

	Number	Percent	Oregon Statewide Percent	Difference
Ages 0-17	1,394	19.1%	20.3%	-1.1%
Ages 18-64	3,963	54.4%	61.1%	-6.7%
Ages 65 and over	1,924	26.4%	18.6%	7.8%

3.8.2 Income and Poverty

The median household income and per capita income in Harney County are lower than for the state of Oregon (Table 3.7.2). In addition, the proportion of people living below the federal poverty
line is higher than the statewide average. The estimated labor force in Harney County is 54.8 percent of the population, which is lower than the statewide average of 62.3 percent.

Table 3.7.2. Socioeconomic Indicators for Harney County

Socioeconomic Variable	Harney County	Oregon
Median Household Income	$40,735	$62,818
Per Capita Income	$26,370	$33,763
Persons in Poverty (%)	14.2%	11.4%
In Civilian Labor Force (16 and older)	54.8%	62.3%

Source: U.S. Census Bureau, QuickFacts. Available at: https://www.census.gov/quickfacts/harneycountyoregon

Harney County is dominantly of white European descent. The American Community Survey identifies 1.5% of the population of the county as Native American, 5.1% as Hispanic, 6.3% are of two or more races and 0.6% are “other”. With a lower mean income than the State average, Harney County residents see a significant out migration of youth from the ages of 10 to the age of 25.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter describes the potential environmental consequences to the resources described in Chapter 3. As discussed in Section 2.3, six resource areas (traffic and transportation, noise, air quality, human health and safety, coastal zones, and other formally classified lands) have been eliminated from consideration in this PEA because impacts would be negligible. Therefore, environmental consequences analyses include biological resources, water resources, earth resources, cultural resources, recreation, socioeconomics, and environmental justice.

4.1 BIOLOGICAL RESOURCES

Impacts to biological resources would be considered significant if implementation of the proposed Agreement resulted in the reduction of wildlife or fisheries populations to a level of concern, removal of land with unique vegetation characteristics, or incidental take of protected species or habitat.

4.1.1 Proposed Action

Wildlife

The primary change in wildlife habitat would be the change from irrigated alfalfa fields to native or naturalized perennial grassland or shrubland species cover. The Harney Basin is dominantly sagebrush steppe with some playa areas of greasewood, silver sage, and saltgrass cover. The CPs associated with the CREP would replace a monoculture of alfalfa with native or naturalized perennial species.

Associated with improved habitat conditions, wildlife diversity in the proposed CREP Area would increase from implementation of the CPs. In comparison to the existing conditions on most of the eligible cropland, wildlife habitats and wildlife diversity would benefit after establishment of each CP. Wildlife would benefit primarily from establishment of permanent wildlife habitat (CP1, CP2, and CP4D). Grassland and ground-nesting birds, ground dwelling mammals, and reptiles generally absent from croplands could benefit primarily from establishment of perennial grass and shrub habitats. Overall, approximately 20,000 acres of habitat would be converted from cropland to native or naturalized semi- arid adapted cover by the implementation of the Proposed Action. The benefits would not be realized until a period of three to four years after implementation of the proposed CREP because of the time required for development of vegetation. Restricting ground and vegetative disturbing CP implementation and maintenance to the periods recommended by NRCS or other technical service providers in accordance with the site-specific conservation plan would have minimal impacts on nest success of ground nesting birds.

Implementation of CP23/23A and the groundwater dependent ecosystem incentive of the HVG CREP will help with the conservation of springs, phreatophyte vegetation and other aquatic organisms dependent on shallow groundwater.

Vegetation

The four CPs that are proposed for implementation under the Harney Basin CREP Proposal would contribute to vegetation diversity in the CREP Area. Establishment of permanent native or naturalized grasses, legumes, and shrubs (CP1, CP2, and CP4D) would benefit vegetation resources in the CREP Area. Figure 4.1.1 identifies the historic vegetation of currently irrigated areas in the Greater Harney Valley Groundwater Area of Concern. The information shows a dominance of irrigation being applied to historic sagebrush steppe (Basin Big Sage, Wyoming Big Sage, etc.) sites with decreasing amounts of wetland or phreatophyte communities

(greasewood, alkaline grassland, silver sage, etc.) affected. CREP implementation would reduce the impact of cropland on the integrity of large tracts of sagebrush steppe habitat.

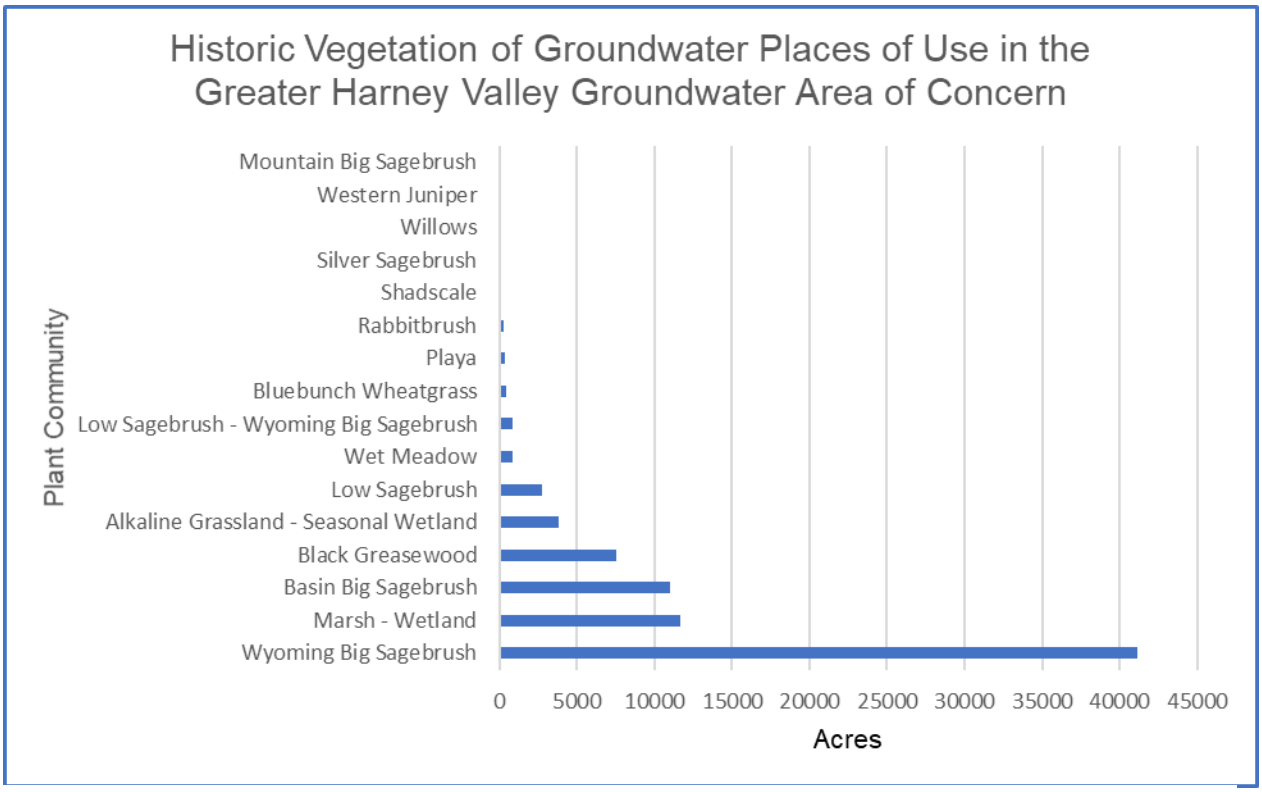


Figure 4.1.1: Vegetation Affected by Current Irrigation Sites

Converting cropland to native or naturalized perennial grasses and shrubs presents the potential of introduced invasive species such as cheatgrass (*Bromus tectorum*). Active management will be necessary to reduce the threat. If converted fields are to be grazed, active management for native or naturalized species will be the primary incentive to reduce invasive species which are typically poor fodder for grazers. Additionally, establishment of native plant communities would help to reduce occurrences of invasive and exotic plant species. Invasive and exotic plants generally thrive in disturbed areas. Intact natural environments, such as those that would be created under the CREP, are least vulnerable to establishment of non-native species. Contract maintenance would include management measures to prevent invasive and exotic plants from reducing the success of planting efforts. Elimination of invasive and exotic plants from the CREP Area would help to ensure that the Harney Basin CREP proposal goals are being cost-effectively accomplished. Vegetation restoration would increase biodiversity on the eligible lands proposed for enrollment.

The groundwater dependent ecosystem incentive payment could help to maintain phreatophyte and/or spring ecosystems. The targeted incentive will encourage landowners near vulnerable phreatophyte communities to enroll in CREP. In 2021, the Nature Conservancy released a report analyzing and identifying phreatophytes that are at risk of losing habitat to declining groundwater levels. This available resource with alongside working with the Nature conservancy will be utilized to ensure particular areas are prioritized and to ensure maximum efficacy of the conservation plans.

Special Status Species
There are no special status species directly supported by groundwater irrigated crops.

4.1.2 Alternative 1 (15,000 Acre Alternative)

The short-term impacts to biological resources would be similar to the proposed action only scaled to 15,000 acres rather than 20,000 acres at full enrollment. Long-term the lands could and likely would be reconverted to cropland. There would be no long-term benefit to vegetation or wildlife from this alternative.

4.1.3 No Action Alternative

Under the No Action Alternative, the Harney Basin CREP proposal would not be implemented. Lands that would have been eligible for enrollment in CREP would remain in agricultural production or would be enrolled in CRP or another conservation program. The continued use of land for agriculture or the conversion of land to another type of agricultural production would increase susceptibility for additional loss of wildlife habitat and invasion by exotic species if abandoned. Runoff of agricultural chemicals would continue to degrade groundwater quality. Additionally, agricultural lands that have been farmed for long periods lack the critical components required for regeneration of native plant communities (seed banks, microorganisms, and nutrients). The accelerated use of groundwater beyond the recharge capabilities would continue to deplete the aquifer resulting in direct adverse impacts to current farming practices.

4.2 WATER RESOURCES

Impacts to water resources would be considered significant if implementation of the Proposed Action resulted in degraded surface or ground water quantity or quality without appropriate mitigation.

4.2.1 Proposed Action

Implementing the Proposed Action would result in ceasing active agricultural irrigation on up to 20,000 acres within the CREP Area. Enrolling land in CREP and installing CPs (planting native or adapted grasses and shrubs) would decrease groundwater withdrawal, reduce the application of agricultural chemicals (pesticides and fertilizers) in the CREP Area, and reduce erosion and sedimentation, ultimately decrease the demand on groundwater storage.

Groundwater
For enrollment in CREP, a groundwater right holder volunteers to cancel their water right permanently in exchange for State compensation for the voluntary cancellation of the right along with annual rental payments, and other incentive payments (groundwater dependent ecosystem incentive, well abandonment incentive) where applicable. The ability to retain the well and convert it to a stock water well with a stock tank with a float valve will be authorized. Retirement of lands under CREP that use groundwater for irrigation would slow the decline in groundwater levels in the Harney Basin aquifer. The Agreement seeks to reduce water use by up to 40,000 – 50,000 acre-feet annually through the curtailment of irrigation groundwater use throughout the CREP Area.

It is estimated that 304,368 acre-feet/year of groundwater has been permitted for irrigation in the Harney Basin (OWRD Technical Assistance Report). Reduction of water rights for some 60,000 acre- feet/year is approximately 20 percent of the total groundwater permitted in the

Harney Basin. There is a difference between the amount permitted and used. Current use is in the 140,000 – 150,000 acre- feet/year range (Beamer and Hoskins, 2021) which would mean that the implementation of the proposed CREP would affect somewhere between 28 and 33 percent of actual use. Enrolling land into CREP and ceasing groundwater irrigation would allow for natural groundwater recharge of the Harney Basin aquifer and reducing the rate of usage of stored groundwater.

The Agreement would allow for temporary irrigation under an approved temporary authorization for up to the first 3 years of the contract to aid in the establishment of a viable conservation cover. This irrigation would not exceed 1.0 acre-feet per acre total for the first three years. Allowing temporary irrigation would slightly reduce the groundwater withdrawal savings during the first few years, but the long-term savings would still be recognized.

Surface Water

The proposal does not have any direct effects on surface water. By reducing groundwater use some reaches of streams, Silver Creek and Blitzen River particularly, may be modestly affected. There is little information on the interaction between surface water and groundwater in the basin.

Water Quality

The decrease in irrigation and the land treatments (fertilizer and other agricultural chemicals) associated with alfalfa production would be halted over a significant portion of the basin. Typical fertilizer application for alfalfa production is annual application of 150 pounds/acre of 11/52 and 100 pounds per acre of sulfur. The cumulative effect of eliminating alfalfa on 20,000 acres would be a reduction of addition of 165 tons of Nitrogen, 780 tons of Phosphorus and 1,000 tons of Sulfur annually to the soil.

While groundwater shows nearly no agricultural chemicals from current sampling, the reduction of agricultural production area would reduce the chance of future contamination of any kind.

Wetlands

Evaluation of the current groundwater irrigated areas have identified nearly 5,000 acres of wetland, playa and other wet habitats (Figure 4.1.1) were altered to create groundwater irrigated fields.

Implementation of CP23/23A is expected to restore wetlands where feasible. The implementation of the proposed action has the potential to enhance wetland resources in the project area.

4.2.2 Alternative 1 (15,000 Acre Alternative)

The 15,000-acre Alternative would not require voluntary cancellation of water rights and would have two significant differences from the proposed action. Upon full enrollment the groundwater savings would be between 30,000 and 37,500 acre-feet/year for the duration of the CREP contract. The other major difference is that the reduction in groundwater use would likely only be for the contract period (15 years). If re-enrollment were allowed the program would be more expensive for each acre-foot/year of savings and time limited. With the majority of groundwater irrigated agriculture drawing from historic water rights, this alternative would only slow aquifer declines for the duration of the contract. After contract expiration, groundwater declines would continue. The primary difference between the proposed action and the 15,000-acre alternative is that the proposed action at full enrollment would involve a permanent reduction in groundwater use in the basin, while the 15,000-acre alternative would involve a temporary reduction in agricultural groundwater use. The basin would remain over allocated with no change in the demand for groundwater irrigation.

4.2.3 No Action Alternative

Under the No Action Alternative, active agricultural production would continue, thereby further degrading water quality from the application of agricultural chemicals and increased erosion and sedimentation from exposed soils. Irrigation would continue to deplete groundwater resources. Producers would still have the option to enroll land in CRP or another conservation program.

4.3 EARTH RESOURCES

Impacts to earth resources would be considered significant if implementation of the Proposed Action resulted in increased erosion and sedimentation or affected topographical or unique soil conditions.

4.3.1 Proposed Action

Under the proposed action, long-term positive impacts to earth resources are expected to occur with the implementation of any of the four proposed CPs outlined in the proposed Agreement. Removing groundwater irrigated agricultural lands from production and establishing permanent cover would stabilize soils and have indirect benefits to water quality by reducing soil erosion and sedimentation caused by typical agricultural practices. During implementation of any of the CPs, there would be potential for minor, increased erosion from any tillage, planting, or earthmoving activities required. However, once the CPs are established long-term beneficial impacts to soil resources would occur from establishment of permanent cover (over the course of the 15-year contract) and removing the need to work the soil for agricultural purposes. Establishment of permanent cover would largely entail native or naturalized arid and semi-arid grasses, legumes, and shrubs.

4.3.2 Alternative 1 (15,000 Acre Alternative)

The 15,000 Acre Alternative would have similar impacts to earth resources as the proposed action only they would be for the limited time of the contract. There would be insufficient time to affect soil conditions during the contract period.

4.3.3 No Action Alternative

Under the No Action Alternative, the Agreement would not be implemented. None of the beneficial impacts to soil resources would occur. Erosion of soils by wind and water would be expected to continue on lands that remain in agricultural production.

4.4 CULTURAL RESOURCES

4.4.1 Proposed Action

Under the Proposed Action, FSA would implement an Agreement for the Harney Basin with the State of Oregon. Up to 20,000 acres of irrigated cropland would be removed from production and would be improved through CPs. The Proposed Action would occur on previously tilled cropland. It is unlikely that unknown eligible cultural resources would be impacted under the Proposed Action because areas that could be enrolled in the CREP have been under cultivation and installation of CPs would not disturb soils deeper than those previously disturbed for agricultural production. In addition, a site-specific evaluation would occur prior to enrollment of any land in CREP that would include identification of cultural resources.

Consultation with the State Historic Preservation Officer and Burns Paiute Tribal Historic Preservation Officer would occur, as appropriate, if FSA environmental staff determined there was a potential to encounter a historic property at a specific location. In accordance with FSA policy, acres would not be accepted for enrollment if an impact to cultural resources is expected. Therefore, the Proposed Action would have no impact to cultural resources in the Harney Basin.

4.4.2 Alternative 1 (15,000 Acre Alternative)

There would be less ground disturbance under this alternative, however like the proposed action there is little potential for impact since the actions would be conversion of irrigated cropland to permanent cover during the life of the contract and the potential for reconversion to cropland after the contract ends.

4.4.3 No Action Alternative

Under the No Action Alternative, FSA would not implement the Agreement; therefore, identification of cultural resources on private land in the Harney Basin would not occur and eligible cultural resources would not be protected.

4.5 RECREATION

Impacts to recreation would be considered significant if they drastically reduced, increased, or removed available public lands designated for recreation or significantly degraded the quality of the recreation. Impacts to environmental conditions such as air, water, or biological resources within or near public recreational land in such a way to affect its use would also be considered significant.

4.5.1 Proposed Action

Under the Proposed Action, FSA would implement an Agreement for the Harney Basin with the State of Oregon. Up to 20,000 acres of irrigated cropland would be removed from production and would be improved through CPs. The establishment of CPs on up to 20,000 acres of cropland would help reduce the decline of groundwater levels in the Harney Basin aquifer.

During establishment of the CPs, there would be short-term negative impacts to local wildlife species due to construction activity. However, once the CPs are established, there would be higher quality wildlife habitat for recreational use in the Harney Basin over the long-term because of the potential 20,000 acres of improved wildlife habitat. Therefore, the Proposed Action would have long-term, beneficial impacts to wildlife-related recreational resources in the Harney Basin.

4.5.2 Alternative 1 (15,000 Acre Alternative)

Alternative 1 would have similar impacts to the proposed action except less area would be involved and the reconversion to crops after the contract ends would have additional impacts and reduction in wildlife habitat.

4.5.3 No Action Alternative

Under the No Action Alternative, FSA would not implement the Agreement; therefore, recreational resources in the Harney Basin would remain unchanged.

4.6 SOCIOECONOMICS

Significance of an impact to socioeconomics varies depending on the setting of the Proposed Action, but 40 CFR 1508.8 states that indirect effects may include those that are growth inducing and others related to causing changes in the pattern of land use, population density, or growth rate. Under CEQ regulations, a socioeconomic impact, in and of itself, does not indicate that preparation of an EIS is warranted. However, a socioeconomic impact can contribute to the overall cumulative impacts of a project.

4.6.1 Proposed Action

Implementation of the Proposed Action would convert up to 20,000 acres of productive groundwater irrigated cropland to dryland pasture. The loss of some 20% of the irrigated agriculture in the basin will have a long-term effect on the property values, local tax revenues, and net agricultural income in Harney County. The 15-year funding for conservation rental and payment for water rights and other incentives will provide a "glide path" for a change in agricultural use of the enrolled property. The CREP proposal will provide producers the option to choose to curtail irrigation in the face of potential forced curtailment by the State of Oregon.

Full enrollment could reduce local property tax revenues by as much as $320,00/year (roughly 13% of the annual County budget) and net revenues to farm owners by $2,520,000/year at the most. While these estimates are based on no revenue from the enrolled lands, future dryland production would provide some amelioration of the impacts. While the impacts are important, they are offset by payments from the CREP program reducing the impact to landowners but resulting in reduced property tax revenues to the local taxing districts.

Full enrollment would reduce the demand for three-phase power requiring the removal of power supply in the basin depending on the location of enrolled fields. Full enrollment could reduce power demand of Harney Electric Cooperative, Inc. by as much as 5.2% (personal communications, Fred Flippence, General Manager July 30, 2021). His estimate of effects on the cooperative were identified as: "I looked at an average horsepower of an irrigation account in the Harney Basin and it was 79 HP. On average a 79HP pump would generate about $4,878.52 in revenue per year for Harney Electric Cooperative. So if you shut off 160 irrigation accounts that would annually drop our revenue by about $780,563 per year." To maintain service the result could be an increased cost of power for local residents.

4.6.2 Alternative 1 (15,000 Acre Alternative)

This alternative would have only a temporary (duration of the contract) impact to electrical power use. As the contracts expire reconversion to crops would entail pumping and require a return of the use of electrical power. The impact on landowners would be less than the permanent loss of irrigation rights under the proposed action. Loss of property taxes would also be less than under the proposed action.

4.6.3 No Action Alternative

Under the No Action Alternative, the Harney Basin CREP Proposal would not be implemented. Funding for retiring agricultural lands would remain limited to what could be generated locally with; however, producers could still enroll land in other conservation programs for financial incentives. Continued demand for irrigation water could threaten long-term sustainability of the agriculture-based economy of the region and potentially result in mandatory shutoffs by the

State. Mandatory shutoffs would most likely be either by seniority of the water rights or by location or both. This would also have a negative implication for property tax revenues and electric power use revenues. Regulatory actions would not provide landowners options other than to immediately change operations with no economic support for the change in agricultural use.

4.7 ENVIRONMENTAL JUSTICE

Environmental justice is achieved when everyone, regardless of race, culture, or income, enjoys the same degree of protection from environmental and health hazards and has equal access to the decision- making process. Significant environmental justice impacts would result if access to decision-making documents was denied or if any adverse environmental effects occurred that would disproportionately affect minority or low-income populations.

4.7.1 Proposed Action

Implementation of the Proposed Action would incentivize agricultural producers to voluntarily remove irrigated agricultural lands from production. Producers would be under no obligation to enroll any lands and the program would be undertaken on a completely voluntary basis. Nearby low-income and minority communities may be adversely affected by the decisions of producers. Since producer's decisions would have effects that spread beyond the boundaries of their farms, into the economies of nearby communities, the livelihoods of environmental justice populations could be affected. The potential for impacts would be greater if there were large areas of CREP enrollment in low-income population areas. The potential for minor positive and minor negative disproportionate impacts to low- income populations exist but would depend on where enrolled producers are located in relation to the low-income populations.

The decision-making document (this PEA) was made available to all interested parties and the public via the Internet and within local FSA offices. In addition, a public meeting was held to provide information on the proposed HVG CREP, and the potential impacts associated with implementation.

4.7.2 Alternative 1 (15,000 Acre Alternative)

The implementation of the 15,000-acre alternative would have a similar impact to the proposed action.

4.7.3 No Action Alternative

Under the No Action Alternative, the proposed HVG CREP would not be implemented.

CHAPTER 5 CUMULATIVE IMPACTS AND COMMITMENT OF RESOURCES

5.1 CUMULATIVE IMPACTS

CEQ regulations stipulate that the cumulative impacts analysis within an Environmental Assessment should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Recent CEQ guidance in considering cumulative impacts involves defining the scope of the other actions and their interrelationship with the Proposed Action. The scope must consider geographical and temporal overlaps among the Proposed Action and other actions. It must also evaluate the nature of interactions among these actions. Cumulative impacts are most likely to arise when a relationship or synergism exists between the Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in proximity to the Proposed Action would be expected to have more potential for a relationship than those more geographically separated.

The greatest difference in the alternatives is that the proposed action would have a permanent and cumulative impact on reduction of the rate of groundwater use in the Harney Valley, while Alternative 1 would have a temporary impact but not a permanent and cumulative impact.

The affected environment for cumulative impacts in this PEA includes Harney County, Oregon.

5.2 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

Past Actions: There have been efforts to reduce the amount of groundwater use in the Harney Basin through incentive programs to convert to more efficient irrigation systems. The Harney County office of NRCS has developed a Conservation Implementation Strategy for Saving Groundwater in the Harney Basin Using Efficient Irrigation Technologies. This initiative was funded in 2019 using Environmental Quality Incentive Program funds. Harney SWCD has partnered with NRCS on the assistance for implementation of the Conservation Implementation Strategy for Saving Groundwater in the Harney Basin Using Efficient Irrigation Technologies.

Harney SWCD has also partnered the Harney Electric Cooperative (HEC) within the service area of Harney County, Oregon to provide both technical assistance for irrigation water management practices like replacement of sprinklers, nozzles, and other hardware on existing irrigation systems. Another popular component of the program is cost share on Variable Frequency Drives (VFDs). A VFD is a type of motor controller that drives an electric motor by varying the frequency and voltage supplied to the- electric motor. The installation typically results in a large economic savings to the producer as well as significant energy delivery savings to the cooperative.

Present Actions: The Harney Basin is one of the pilots for integrated water resource planning under guidelines developed by OWRD (https://www.oregon.gov/owrd/programs/Planning/PlaceBasedPlanning/Pages/default.aspx). The groundwater portion of the integrated water resource plan for the Harney basin was completed in August of 2022. The groundwater plan identified some 27 different strategies to

address the declining groundwater conditions in the basin. The plan identified various strategies to better manage groundwater that ranged from measurement of groundwater use to water markets, to voluntary agreements, and other means of reducing groundwater use. Beyond the strategies proposed, OWRD has the authority to regulate the use of groundwater.

Reasonably Foreseeable Future Actions: With the completion of the USGS/OWRD groundwater study of the Harney basin, OWRD will initiate a Rules Advisory Committee to consider the Basin Rules for the Malheur Lakes Basin. The current rule language is: "(12) Within 1 year after the Groundwater Study discussed in subsection 11 has been published by the Department, the Department will convene a Rules Advisory Committee to explore whether there is a need for updates or changes to these rules. Members of the Groundwater Study Advisory Committee will be invited to participate on the Rules Advisory Committee." This effort will be initiated before mid-year 2023.

Documentation of areas of significant groundwater level decline in the Harney basin in the USGS/OWRD study could trigger the consideration of designating "Critical Groundwater Management Area(s)" in those areas of the basin having the greatest effect from groundwater pumping. The resulting designation and application of management measures will result in mandatory reductions in use within the areas so designated. Reductions are typically according to priority date, with no other considerations and no compensation for reductions in use.

OWRD also has the authority to designate a serious water management problem area under ORS 540.435 as defined in rule at OAR 690-085-0008 through 690-085-0030. This designation would require reporting all water use in the area so designated.

The proposed action would have the greatest impact when combined with the other activities proposed to address declining groundwater levels and provide economic support for the transition to reduced groundwater use.

5.3 CUMULATIVE EFFECTS ANALYSIS

The incremental contribution of impacts of the Proposed Action, when considered in combination with other past, present, and reasonably foreseeable actions, are expected to add positively to the long-term cumulative impacts to biological, water, earth, and other protected resources in the proposed CREP area. The focused impact on groundwater resources will be significant and provide both a benefit to the agricultural economy in the long-term and to groundwater dependent ecosystems. Short term negative direct impacts to biological and water resources may occur during establishment of CPs.

5.4 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible and irretrievable commitments are related to the use of nonrenewable resources and the effect that the use of these resources has on future generations. Irreversible effects primarily result from the use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. The Harney Basin CREP Proposal would improve natural resources, water resources, and wildlife habitat; there would be no irretrievable or irreversible resource commitments. Reducing groundwater use will help to ameliorate the loss of stored groundwater. Current rates of groundwater use are having irretrievable loss of stored groundwater.

CHAPTER 6 MITIGATION MEASURES

The purpose of mitigation is to avoid, minimize, or eliminate significant negative impacts on affected resources. CEQ regulations (40 CFR 1508.20) state that mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

CEQ regulations state that all relevant reasonable mitigation measures that could avoid or minimize significant impacts should be identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies. This serves to alert agencies or officials who can implement these extra measures and will encourage them to do so. The lead agency for this Proposed Action is FSA.

There are no expected long-term significant negative impacts associated with implementation of the Agreement. Prior to installation of CPs, producers must complete site-specific environmental evaluations which would reveal any protected resources on the property. In those site-specific instances where a wetland, threatened or endangered species, or a cultural resource may be present, consultation with the appropriate lead agency would identify specific mitigation measures required to eliminate or reduce the negative impacts to an acceptable level. In addition, each producer must prepare an approved site-specific conservation plan to ensure protection of all valuable resources for the duration of the contract (15 years). To be eligible the landowner will voluntarily cancel their water rights permanently.

CHAPTER 7 LIST OF PREPARERS

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Years of Experience: 41

CHAPTER 8 PERSONS AND AGENCIES CONSULTED

USDA FSA National
Office USDA FSA
Oregon Office

Oregon Watershed Enhancement
Board Oregon Water Resources
Department Oregon Department
of Agriculture Oregon
Department of Fish & Wildlife

Other Federal Agencies, State Agencies, and Interested Parties

Harney County Watershed
Council High Desert
Partnership
Harney SWCD
Oregon NRCS State Office
Oregon State University
Extension The Nature
Conservancy
WaterWatch of
Oregon Oregon
Farm Bureau
Harney County Farm
Bureau
USFWS, Malheur National Wildlife
Refuge Bureau of Land
Management

CHAPTER 9 REFERENCES

Albano, Christine M., Blake Minor, Zach Freed, and Justin L. Huntington. 2020. Status and Trends of Groundwater Dependent Vegetation in Relation to Climate and Shallow Groundwater in the Harney Basin, Oregon. Publication No. 41280. Division of Hydrologic Sciences, Desert Research Institute and The Nature Conservancy. 45 p.

Bailey, R.G. 1995. Description of Ecoregions of the United States. 2d ed. Misc. Pub. 1391, U.S. Department of Agriculture, Forest Service. Washington D.C. p. 71-73 with separate map.

Beamer, J.P. and M.D. Hoskinson. 2021. Historical Irrigation Water Use and Groundwater Pumpage Estimates in the Harney Basin, Oregon, 1991-2018. OWRD Open File Report No. 2021-02. 51 p.

Blus, Lawrence J., Chris S. Staley, Charles J. Henny, Grey W. Pendleton, Tim H. Craig, Erica H. Craig and Douglas K. Halford. 1989. Effects of Organophosphorus Insecticides on Sage Grouse in Southeastern Idaho. The Journal of Wildlife Management. 53 (4): 1139-1146.

Council on Environmental Quality (CEQ). 1997. Council on Environmental Quality. Guidance under the National Environmental Policy Act

Freed, T.Z., Schindel, M.S., Ruffing, C., & Scott, S. 2022. Oregon Atlas of Groundwater Dependent Ecosystems and Species: Second Edition. The Nature Conservancy. Reston, VA.

Garcia, C.A., Corson-Dosch, N.T., Beamer, J.P., Gingerich, S.B., Grondin, G.H., Overstreet, B.T., Haynes, J.V., and Hoskinson, M.D., 2022, Hydrologic budget of the Harney Basin groundwater system, southeastern Oregon: U.S. Geological Survey Scientific Investigations Report 2021–5128, 144 p.

Gingerich, S.B., Johnson, H.M., Boschmann, D.E., Grondin, G.H., and Garcia, C.A., 2022, Groundwater resources of the Harney Basin, southeastern Oregon: U.S. Geological Survey Scientific Investigations Report 2021–5103, 116 p.

Grondin, G.H. 2021. Methods and Results for Estimating Groundwater Pumped and Consumed for Non- Irrigation Uses in the Harney Basin, Oregon. OWRD Open File Report No. 2021-03. 28

Greater Harney Basin Local Advisory Committee. 2017. Greater Harney Basin Agricultural Water Quality Management Area Plan. December 2017. 54 p.

Haxton-Evans, Paige and Dan Brown. 2021. Statewide Groundwater Quality Monitoring Program: Harney County. Oregon Department of Environmental Quality Report No. DEQ21-LAB-0012-TR. May 2021. 66 p.

High Desert Partnership. 2022. Harney Basin Wetlands Initiative Strategic Action Plan 2021-2027. 80 p.

Mucken, A., & Bateman, B. (Eds.). 2017. Oregon's 2017 Integrated Water Resources Strategy. Oregon Water Resources Department. Salem, OR. 186 p.

Natural Resources Conservation Service. 2006. Soil Survey of Harney County Area, Oregon. 1513 p.

Oregon Department of Environmental Quality. 2018. Air Quality website (https://www.oregon.gov/deq/aq/Pages/Maintenance-Areas.aspx) viewed November 24, 2018.

Orr, Elizabeth and William, and Baldwin Ewart. 1992. Geology of Oregon. Fourth edition

Quigley, Thomas M. and Sylvia J. Arbelbide. 1997. An assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins: volume 1. Gen. Tech. Rep. PNW- GTR-405. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 2111 p.

Sexton, N.R., Dietsch, S.M., Don Carlos, A.W., Koonz, L., Solomon, A.N., & Miller, H.M. 2012. National Wildlife Refuge visitor survey 2010/2011: Individual Refuge Results for Malheur National Wildlife Refuge. U.S. Geological Survey and U.S. Fish & Wildlife Service.

Smitherman, Lauren L. 2015a. Forensic Hydrogeography: Assessing Groundwater Arsenic Concentrations and Testing Methods in the Harney Basin, Oregon. White paper. 8 p.

Snyder, C.T., F.F. Hardman Zdenek. 1964. Pleistocene lakes in the Great Basin. U.S. Geological Survey Miscellaneous Geologic Investigations Map I-416.

Swensen, Jon E., Claire A. Simmons, and Charles D. Eustace. 1987. Decrease of sage grouse *Centrocerus urophasianus* after ploughing of sagebrush steppe. Biological Conservation. 41(2): 125-132.

Thorson, T.D., Bryce, S.A., Lammers, D.A., Woods, A.J., Omernik, J.M., Kagan, J., Pater, D.E., and Comstock, J.A., 2003. Ecoregions of Oregon (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

U.S. Environmental Protection Agency (USEPA). 2012a. National Ambient Air Quality Standards. http://www.epa.gov/air/criteria.html. Last updated 01 May 2012. Website accessed on 21 May 2012.

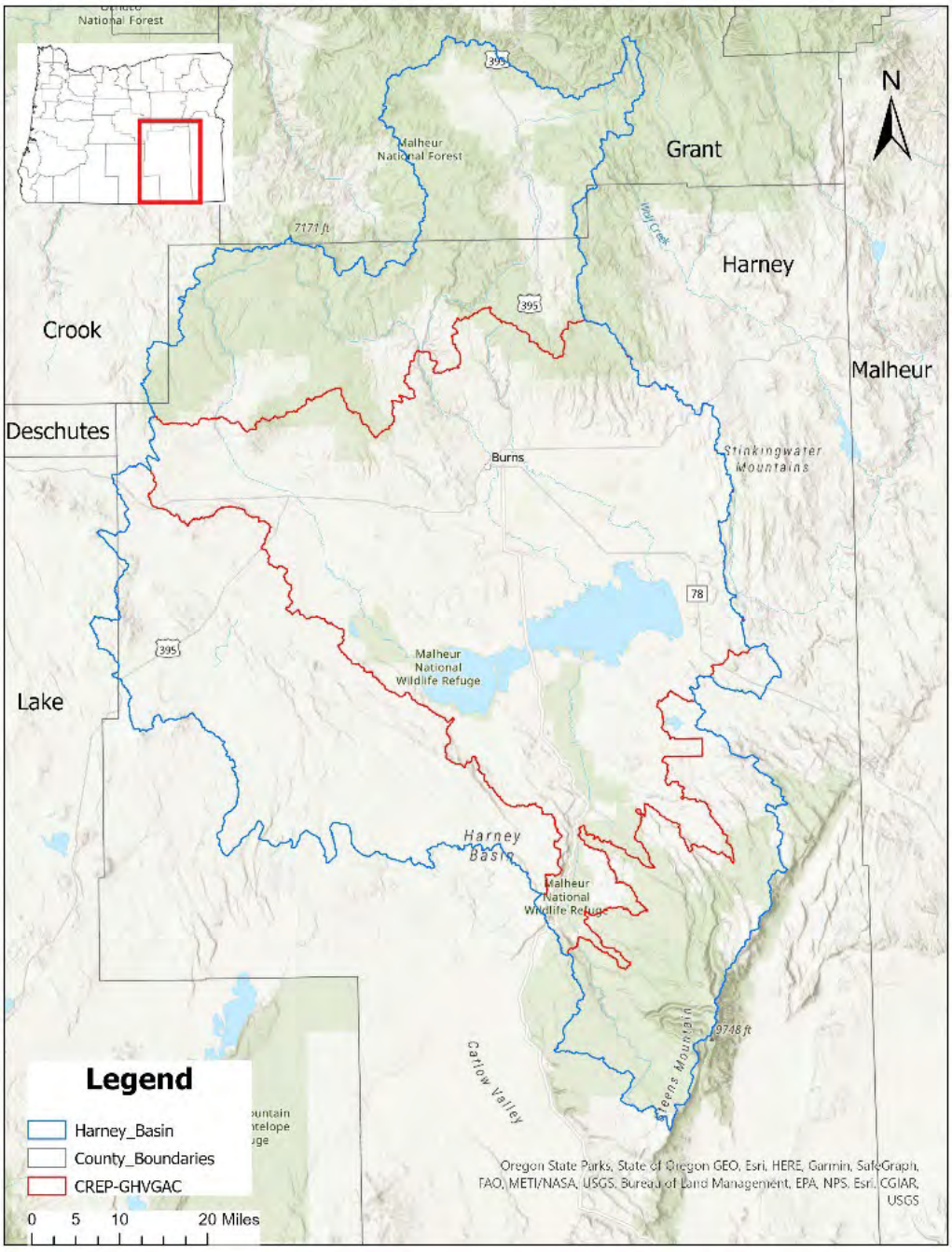
U.S. Fish and Wildlife Service. 2021. Birds of Conservation Concern 2021. United States Department of the Interior, U.S. Fish and Wildlife Service, Migratory Birds, Falls Church, Virginia. 47 p. http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php

Wisdom, Michael J., Mary M. Rowland, Barbara C. Wales, Miles A. Hemstrom, Wendel J. Hann, Martin G. Raphael, Richard S. Holthausen, Rebecca A. Gravenmier, and Terrell D. Rich. 2002. Modeled Effects of Sagebrush-Steppe Restoration on Greater Sage-Grouse in the Interior Columbia Basin, U.S.A. Conservation Biology 16(5): 1223–1231.

APPENDICES

A MAP OF PROPOSED HARNEY VALLEY GROUNDWATER CREP AREA
B HARNEY VALLEY GROUNDWATER CREP PROPOSAL
C SENSITIVE BIRD SPECIES IN THE HARNEY VALLEY AREA

Appendix A



Map of proposed of Harney Valley CREP area within Harney Basin

Appendix B

Oregon
Kate Brown, Governor

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January 26, 2022

Ms. Kimberly Martin
Acting CREP Program Manager
CREP/CRP Program Specialist
Central Region USDA – Farm Service Agency
Illinois State FSA Office
3500 Wabash Avenue
Springfield, IL 62711

Dear Ms. Martin,

Thank you very much for assisting Mr. Gall and Mr. Bierly with necessary considerations for a Harney Valley Groundwater Conservation Reserve Enhancement Program proposal. Your timely assistance and responsiveness is greatly appreciated. Following your conversations with my staff, we are submitting the attached proposal for formal Farm Service Agency (FSA) review.

We look forward to having a tool to use for the voluntary reduction of the groundwater demand on the Harney Valley aquifer. We believe this proposal makes a significant difference to the producers in the area and assists with diminishing the groundwater overdraft in the basin, helping to provide a more sustainable water supply for the remaining groundwater irrigators.

Thank you again for your assistance. We look forward to working with the FSA on this important program. If questions arise, please feel free to contact Ivan Gall at Ivan.K.Gall@water.oregon.gov or by phone at (971) 283-6010. Ken Bierly can be reached at bierlykenneth@gmail.com or by phone at (503) 362-6860.

Sincerely,

Thomas M. Byler, Director
Oregon Water Resources Department

cc: Ivan Gall – Field Services Division Administrator, OWRD
Jason Spriet – East Region Manager, OWRD
Ken Bierly, Bierly & Associates

Appendix C

Sensitive Bird Species in the Harney Valley

Species	Status	Breeding Season
Bald Eagle (*Haliaeetus leucocephalus*)	Non-BCC Vulnerable	Jan 1 to Aug 31
Black Tern (*Chlidonias niger*)	BCC Rangewide (CON)	May 15 to Aug 20
Bobolink (*Dolichonyx oryzivorus*)	BCC Rangewide (CON)	May 20 to Jul 31
Cassin's Finch (*Carpodacus cassinii*)	BCC Rangewide (CON)	May 15 to Jul 15
Clark's Grebe (*Aechmophorus clarkia*)	BCC Rangewide (CON)	Jun 1 to Aug 31
Evening Grosbeak (*Coccothraustes vespertinus*)	BCC Rangewide (CON)	May 15 to Aug 10
Franklin's Gull (*Leucophaeus pipixcan*)	BCC Rangewide (CON)	May 1 to Jul 31
Golden Eagle (*Aquila chrysaetos*)	Non-BCC Vulnerable	Jan 1 to Aug 31
Lesser Yellowlegs (*Tringa flavipes*)	BCC Rangewide (CON)	elsewhere
Lewis's Woodpecker (*Melanerpes lewis*)	BCC Rangewide (CON)	Apr 20 to Sep 30
Long-eared Owl (*Asio otus*)	BCC Rangewide (CON)	Mar 1 to Jul 15
Marbled Godwit (*Limosa fedoa*)	BCC Rangewide (CON)	elsewhere
Olive-sided Flycatcher (*Contopus cooperi*)	BCC Rangewide (CON)	May 20 to Aug 31
Rufous Hummingbird (*Selasphorus rufus*)	BCC Rangewide (CON)	Apr 15 to Jul 15
Sage Thrasher (*Oreoscoptes montanus*)	BCC - BCR	Apr 15 to Aug 10
Willet (*Tringa semipalmata*)	BCC Rangewide (CON)	Apr 20 to Aug 5
Greater Sage Grouse (*Centrocercus urophasianus*)	BCC Rangewide (CON)	

BCC = Birds of Conservation Concern

BCR = Birds of Conservation Regions

CON = Continental USA